# 2003, January - Salinas Valley Water Project Engineer's Report

Monterey County
Water Resources Agency

# Salinas Valley Water Project

# Engineer's Report

January 2003

RMC
Raines, Melton & Carella, Inc.
Consulting Engineers and Managers

# ENGINEER'S REPORT

## To Support an Assessment for The Salinas Valley Water Project of the Monterey County Water Resources Agency

Prepared by:
Lyndel W. Melton
Principal
Registered Professional Engineer

Raines, Melton & Carella, Inc.
Consulting Engineers/Project Managers

# Table of Contents

**List of Figures** ..... **II**

**List of Tables** ..... **II**

**List of Abbreviations** ..... **III**

**Executive Summary** ..... **ES-1**

**1 Introduction** ..... **1-1**

1.1 PURPOSE OF ENGINEER'S REPORT ..... 1-2

**2 Project Description** ..... **2-1**

2.1 EXISTING FACILITIES ..... 2-1

2.2 PROPOSED PROJECT ..... 2-1

*2.2.1 Operation and Maintenance of Nacimiento and San Antonio Reservoirs* ..... *2-1*

*2.2.2 Nacimiento Dam Spillway Modifications* ..... *2-3*

*2.2.3 Salinas River Surface Diversion Facility* ..... *2-4*

2.3 COST ESTIMATE OF PROPOSED PROJECT COMPONENTS ..... 2-9

**3 Assessment Methodology** ..... **3-1**

3.1 BENEFIT ZONE DEFINITION ..... 3-2

3.2 DEFINITION OF BENEFIT ..... 3-5

*3.2.1 Water Supply and Flood Protection Benefits* ..... *3-5*

*3.2.2 Active/Passive Use of Land* ..... *3-9*

*3.2.3 Benefit Evaluation* ..... *3-11*

3.3 COST ALLOCATION METHODOLOGY ..... 3-14

3.4 ASSESSMENT RATES ..... 3-17

**4 References** ..... **4-1**

**Appendix A – Detailed Cost Estimates** ..... **A-1**

**Appendix B – Water Quality Data** ..... **B-1**

# List of Figures

**Figure 2-1: Existing Nacimiento Spillway Structure ..... 2-5**
**Figure 2-2: Rubber Dam at the Nacimiento Spillway ..... 2-6**
**Figure 2-3: Salinas River Diversion Facility and Current CSIP System ..... 2-7**
**Figure 2-4: Plan View of the Salinas River Diversion Facility ..... 2-8**
**Figure 3-1: Proposed Zone 2C ..... 3-4**

# List of Tables

**Table 2-1: Project Components Estimated Cost ..... 2-10**
**Table 3-1: Cost Allocation Committee Membership ..... 3-2**
**Table 3-2: Special Benefits ..... 3-9**
**Table 3-3: Land Use Factors ..... 3-9**
**Table 3-4: Assessment Guidelines ..... 3-10**
**Table 3-5: Zone Land Use Acreages ..... 3-10**
**Table 3-6a: Operations Benefits ..... 3-11**
**Table 3-6b: Spillway Benefits ..... 3-11**
**Table 3-6c: Diversion Benefits ..... 3-12**
**Table 3-6d: Operations Weighted Benefits ..... 3-12**
**Table 3-6e: Spillway Weighted Benefits ..... 3-13**
**Table 3-6f: Diversion Weighted Benefits ..... 3-13**
**Table 3-7: Benefit Ratios ..... 3-14**
**Table 3-8: Equivalent Agricultural Acreage Calculation for Upper Valley ..... 3-15**
**Table 3-9: Total Equivalent Agricultural Acreages ..... 3-15**
**Table 3-10: Cost Share Factors and Ratios ..... 3-16**
**Table 3-11: Cost Allocation and Total Cost to Benefit Zones ..... 3-17**
**Table 3-12: Unit Assessment by Zone and Land Use ($/Acre) ..... 3-18**
**Table 3-13: Assessment Administration by Land Use ($/Acre) ..... 3-18**
**Table 3-14: Estimated Assessments for Zone 2C ..... 3-19**

# List of Abbreviations

| | |
|---|---|
| AF | Acre-Feet |
| AFY | Acre-Feet per Year |
| CDFG | California Department of Fish and Game |
| CDHS | California Department of Health Services |
| cfs | Cubic feet per second |
| CSIP | Castroville Seawater Intrusion Project |
| DSOD | California Department of Water Resources Division of Safety of Dams |
| EIR | Environmental Impact Report (state) |
| EIS | Environmental Impact Statement (federal) |
| FERC | Federal Energy Regulatory Commission |
| HBA | Historic Benefits Analysis |
| MCWD | Marina Coast Water District |
| MCWRA | Monterey County Water Resources Agency |
| MCWRP | Monterey County Water Recycling Projects |
| MGD | million gallons per day |
| MRWMD | Monterey Regional Waste Management District |
| MRWPCA | Monterey Regional Water Pollution Control Agency |
| NMFS | National Marine Fisheries Service |
| NOP | Notice of Preparation |
| O&M | Operation and Maintenance |
| PMF | Probable Maximum Flood |
| RWQCB | Regional Water Quality Control Board |
| SRDF | Salinas River Diversion Facility |
| SVIGSM | Salinas Valley Integrated Ground and Surface Water Model |
| SVWP | Salinas Valley Water Project |
| SWRCB | State Water Resources Control Board |
| USEPA | U S Environmental Protection Agency |
| USFWS | U S Fish and Wildlife Service |

# Executive Summary

# Executive Summary

This Engineer's Report has been prepared to describe the technical basis for a new assessment that would, if passed, fund the capital and operation and maintenance costs of the recommended Salinas Valley Water Project (SVWP). The Salinas Valley Water Project includes:

- Operation and maintenance of the existing reservoirs;
- Construction of the Nacimiento Dam Spillway Modifications; and
- Construction of the Salinas River Diversion Facility.

The Monterey County Resources Agency (MCWRA) would implement the project to meet the water supply goals of the Salinas Valley, which include:

- Halting seawater intrusion;
- Continuing conservation of winter flows for recharge of the Salinas Valley basin through summer releases;
- Providing flood protection;
- Improving long-term hydrologic balance between recharge and withdrawal; and
- Providing a sufficient water supply to meet water needs through the year 2030.

The purpose of this Engineer's Report is to document an assessment methodology developed by MCWRA for a special assessment that could fund the proposed project. This report includes a general description of the project, documentation of the assessment methodology, delineation of the zones of benefit, and the proposed assessments. Proposition 218 requires this type of report in order to provide voters with factual information needed to decide whether or not to approve a new special assessment.

**Project Description**

The proposed project consists of three distinct components that will meet the identified project goals. The three project components are:

- Operation and maintenance of the existing reservoirs;
- Construction of the Nacimiento Dam Spillway Modifications; and
- Construction of the Salinas River Diversion Facility.

The first component, operation and maintenance of the existing reservoirs, includes direct operations and maintenance of the existing facilities, along with the associated activities of maintenance of the Salinas River channel, Salinas River mouth, cloud seeding, debris clearing, data collection and management, and other administrative tasks.

Operation and maintenance of the existing facilities is presently funded through the Standby and Availability Charges associated with MCWRA Special Benefit Zones 2 and 2A. The operation and maintenance of those facilities has been included in the project definition since, if approved, the proposed assessments described in this Engineer's Report would replace the Standby and Availability Charges associated with MCWRA Special Benefit Zones 2 and 2A.

The second component is construction of the spillway modifications at Nacimiento Dam. The proposed improvements include lowering of the existing spillway, installation of an inflatable dam on the new spillway sill, and enlargement of the spillway chute. The inflatable dam would be lowered during a large flood event to preclude the dam from overtopping during the probable maximum flood (PMF) event. The

inflatable dam would be raised after the winter rains, allowing the reservoir storage to be maintained at its present 800-foot maximum pool elevation.

These improvements at Nacimiento Dam are necessary to meet the California Department of Water Resources, Division of Safety of Dams (DSOD) requirements associated with protecting the reservoir and dam against the PMF event.

Modification of the spillway at Nacimiento Dam would allow for changes in the current operation (reoperation) of both reservoirs. Reoperation would involve changes in the amount, frequency, and schedule of releases of water from the reservoirs into the Nacimiento and San Antonio Rivers, which in turn flow into the Salinas River. This reoperation of the dams would not involve physical improvements or capital costs.

By increasing the capacity of the spillway and reoperating Nacimiento Reservoir, more water can be stored during the winter/spring, while still providing for passage of the PMF, thus making more water available for release later in the year. The additional water can be used to supplement and/or replace existing groundwater use through a surface diversion and/or groundwater recharge.

The third component is the construction of the Salinas River Diversion Facility, an inflatable diversion structure and associated fish screen and pumping facilities that would allow for diversion of Salinas River water into the existing Castroville Seawater Intrusion Project (CSIP) distribution system. The diverted Salinas River water would be blended with recycled water produced at the Monterey County Water Recycling Project facilities to meet the irrigation needs of approximately 12,800 acres of irrigated agricultural lands within the CSIP service area (Zone 2B). The diverted Salinas River water would replace current groundwater pumping and provide for improved and more uniform irrigation water quality within the CSIP service area. The cost associated with operating and maintaining the Salinas River Diversion Facility will be included in the water delivery charge for Zone 2B water recipients. The reduction in groundwater pumping is anticipated, in conjunction with other projects undertaken by MCWRA, to result in halting seawater intrusion in aquifers underlying the Salinas Valley.

Table ES-1 summarizes the estimated cost of the project components. In addition, there is an estimated annual cost of $0.27 million associated with maintaining the assessment. The overall annual cost of the project is $3.86 million.

**Formation of Cost Allocation Committee and the Recommended Assessment Methodology**

The Assessment Committee (Committee) was a committee of the Salinas Valley interests that was originally formed by order of Judge Silver as part of the Orradre et al. vs. MCWRA litigation. The committee was charged with the responsibility to develop a new and proportional form of assessment(s) to replace the existing Zone 2 and 2A uniform water standby charges. In considering new forms of assessment(s), the original committee was to take into account the extent to which MCWRA makes water available to the assessed land, the reduction of overdraft, the prevention of seawater intrusion, and any other water availability, flood control, groundwater quality and other benefits conferred on the assessed lands.

## Table ES-1: Project Component Estimated Cost

| Project Component | Total Capital Costs ($ Millions) | Total Annual O&M Costs ($ Millions) | Total Estimated Annual Cost ($ Millions) |
|---|---|---|---|
| Reservoir Operations and Maintenance | $0 | $2.37 | $2.37 |
| Nacimiento Dam Spillway Modifications | $7.30 | $0 | $0.47 |
| Salinas River Diversion Facility | $11.50 | $0 | $0.75 |
| **Total** | **$18.80** | **$2.37** | **$3.59** |
| Assessment Administration | $0 | $0.27 | $0.27 |
| **Overall Total** | **$18.80** | **$2.64** | **$3.86** |

Notes:
1. All costs are based on August 2002 San Francisco ENR CCI of 7657.
2. Annualized costs are based on a 30-year capital recovery period at 5% interest.
3. All cost estimates are rounded to the nearest $10,000.
4. Capital Costs include engineering, construction, construction management, and financing for each component.
5. O&M costs associated with the Nacimiento Dam Spillway Modifications are included in the Reservoir Operations and Maintenance costs.
6. O&M costs associated with the Salinas River Diversion Facility will be recovered through a water delivery charge to be paid by the users.

One of the main focuses of the group was to develop assessment strategies that would be used by MCWRA. The group was charged with developing strategies that would be technically based, equitable, and reflect an understandable allocation of the benefits of MCWRA's projects. The new assessment strategy must conform to the requirements of the California Constitution as amended by Proposition 218. Proposition 218 requires that a land based assessment must be levied based on the benefit received from the project, and each parcel would pay an assessment based on the level of benefit received from the project.

The original Committee was unable to meet its objective, and the issue returned to court where Judge Silver upheld the validity of the existing Zones 2 and 2A assessments. The remaining members of this group continued to meet, and decided to broaden membership and include groups from other Salinas Valley interests, such as urban areas.

A Technical Sub-Committee (Technical Committee) was formed based on Judge Silver's order. One purpose of the Technical Committee was to recommend a new boundary for the proposed zone of benefit. The Technical Committee members were Dennis Williams, Joe Scalmanini, Peter Pyle, and Lyndel Melton (Peter Pyle was invited to participate but declined).

The Committee and its Technical Committee completed its work in early 2001. The Committee prepared a letter dated July 16, 2001 summarizing its findings and recommendations, and presented that letter to MCWRA's Board of Directors.

The MCWRA Board of Directors formed the Cost Allocation Committee (CAC) on July 23, 2001. The purpose of the CAC is to develop and present to the MCWRA Board of Directors a recommended basis for assessment for the benefits received from the SVWP that fully complies with the provisions of Proposition 218. The CAC has met regularly over the last year to develop and finalize a set of recommendations for an assessment to finance the SVWP. The CAC members included representatives from the various sub-areas in the Salinas Valley and consisted of representatives from the agriculture community, development interests, and urban communities (See Table 3-1 for member list).

**Zone of Benefits**

The first step in developing the assessment was the identification of the assessment zone, or benefit zone, namely the area that would benefit from operation of the two reservoirs and construction of the proposed project. A new assessment zone, Zone 2C, was identified and proposed for creation, as required by Proposition 218, to include the lands that receive special benefit from the proposed SVWP. These benefits are deemed special benefits and therefore only those parcels that receive the special benefit are expected to fund the project.

Zone 2C has been defined based on geological conditions and hydrologic factors, which define and limit the benefits derived from the reservoirs and the proposed changes to the operations, storage, and release of water from the reservoirs. The eight criteria used to establish Zone 2C are presented in Section 3.1. The proposed zone is separated into seven major hydrologic sub-areas, as shown in Table ES-2.

### Table ES-2: Areas of Benefit Within Zone 2C

| |
|---|
| Extended Upper Valley – Above Dam |
| Extended Upper Valley –Below Dam |
| Upper Valley |
| Forebay |
| Pressure |
| East Side |
| Arroyo Seco |

In addition to refining the Zone 2C boundary, the CAC also refined the definition of the sub-areas. The sub-area definitions are based on the work originally presented in DWR Bulletin 52. Two additional sub-areas were identified that are upstream of the Upper Valley sub-area, as defined in DWR Bulletin 52. The first of these two new sub-areas extends from the Upper Valley sub-area south to the Monterey/San Luis Obispo County line and eastward to the downstream face of San Antonio Dam. The second new sub-area extends upstream of San Antonio Dam to include lands adjacent to San Antonio Reservoir. Both of these areas were added because it was determined that they receive benefit from the existing reservoir operations.

The proposed Zone 2C, including the sub-areas, is shown in Figure ES-1.

**Definition of Benefits**

The proposed assessment is based upon the concept that the benefits received from the proposed SVWP are determined by two factors. The first factor measures the water supply and flood protection benefits derived from the proposed SVWP. The second factor is dependent upon the whether the land owner is actively or passively utilizing the land.

*Water Supply and Flood Protection Benefits*

Seawater intrusion was identified as a significant problem in the Salinas Valley in the 1940's. The DWR Bulletin 52 was issued in 1946 to address the increasing seawater intrusion problem. Bulletin 52, along with subsequent studies, lead to implementation of a series of projects in the Salinas Valley aimed at addressing water supply, groundwater overdraft, and seawater intrusion. The construction of Nacimiento and San Antonio Reservoirs were the first projects to be implemented.

The reservoirs currently provide water supply and flood protection benefits. Flood protection is achieved through storage of river flows to reduce peak flows downstream of the reservoirs. The flood damage reduction is estimated to be approximately $10 million per year. Water supply is achieved by storing water for release during times of year when river flows typically would be minor. The additional water can be used to increase groundwater recharge. Groundwater recharge has increased by approximately 30,000 acre feet per year since the construction of Nacimiento and San Antonio Reservoirs.

The Technical Committee developed a list of special benefits provided by the SVWP. The benefits are a result of achieving the goals of the SVWP. The CAC reviewed the list of benefits recommended by the Technical Committee and concurred with the recommendations presented in the Engineer's Report.

The water supply and flood protection benefits provided by the reservoirs are not equal. Some benefits are secondary benefits that occur due to providing the primary benefits. To account for this, a weighting factor is assigned to each of the benefits to distinguish the level of benefit received.

### Table ES-3: Special Benefits

| Special Benefit | Weighting Factor |
|---|---|
| Control of Seawater Intrusion | 3 |
| Flood Control | 3 |
| Increased Recharge | 1 |
| Groundwater Quality | 1 |
| Timing and Location of Recharge | 1 |
| Drought Protection | 1 |
| Preservation of Aquifer Storage | 1 |
| Recreation | 1 |

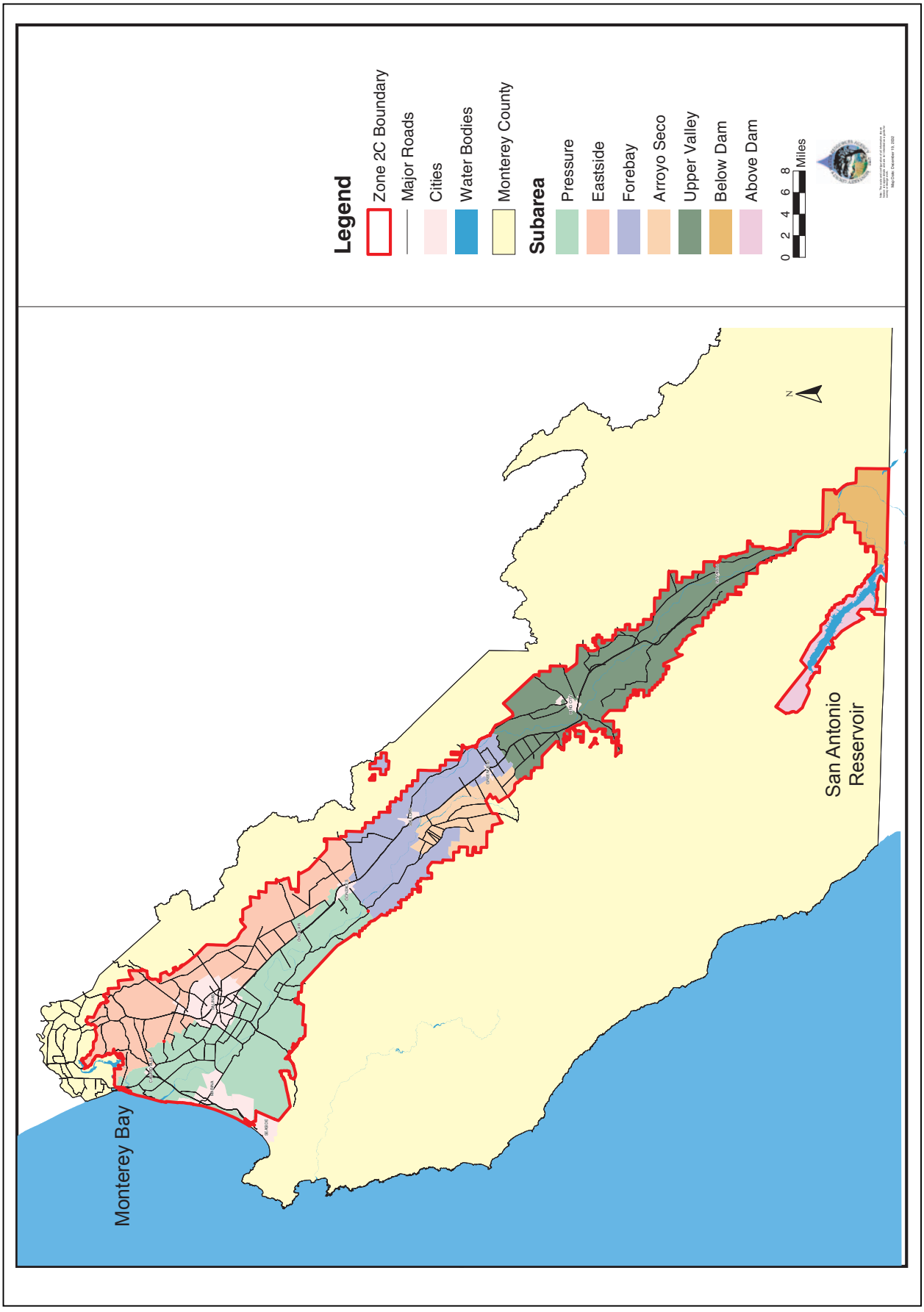
*Active/Passive Use of Land*

Land use factors were assigned based on whether the land is actively or passively used. Active use of the land means the land owner has put the land to its potential use, with the highest potential uses being residential, apartments, commercial, industrial, institutional, and irrigated agricultural uses. Dry farming, grazing, vacant lot, lands subject to frequent flooding, and native lands (lands receiving no charge) are lower level of use of land, or a more passive use. Land use factors of 0.1 and 0.01 were assigned, respectively, for these more passive uses of land, consistent with the existing assessment methodology utilized for Zones 2 and 2A.

The various active/passive use categories and associated factors are presented Table ES-4:

### Table ES-4: Proposed Active/Passive Use of Land

| Land Use | Active/Passive Use of Land Factor |
|---|---|
| Irrigated Agriculture | 1 |
| Residential (1-4 Units) | 1 |
| Apartments (over 4 units), Commercial | 1 |
| Institutional Land | 1 |
| Industrial Land | 1 |
| Dry Farm, Grazing, and Vacant Lot | 0.1 |
| River Channels and Lands with Frequent Flooding | 0.01 |
| Land Receiving No Charge | 0 |




**Proposed Zone 2 C**

Figure ES-1

*Source: MCWRA 12-02*

The use of land factor was used to determine the equivalent acreage of a parcel based on its designated land use. Equivalent acreage is defined as the amount of acreage of a given land use that receives benefits similar to the greatest level of benefit. Irrigated agriculture, residential, apartment, commercial, institutional and industrial uses has been identified as receiving the same benefit the proposed SVWP. Dry farming, grazing, and vacant lots receive a lesser level of benefit. The equivalent acreage is utilized in the development of the assessment rates that were used to calculate each parcel's share of the cost.

**Benefit Evaluations**

The benefits were evaluated separately for each of the three major components:

- Operation and maintenance of Nacimiento and San Antonio Reservoirs;
- Construction of the Nacimiento Dam Spillway Modifications; and
- Construction of the Salinas River Diversion Facility.

The level of benefit received in each sub-area was established through a series of evaluations. First, the findings of the Technical Committee relative to operation of the two existing reservoirs were used, as a basis to identify and assign benefit factors for each of the SVWP components within each of the sub-areas. The relative benefit rankings developed by the Technical Committee were refined and presented to the CAC.

The results of the benefit analysis are summarized in Tables ES-5a through ES-5c.

### Table ES-5a: Benefit Matrix for Operation and Maintenance of Nacimiento and San Antonio Reservoirs

| Area | Ratio |
|---|---|
| Extended Upper Valley - Above Dam | 2.7 |
| Extended Upper Valley - Below Dam | 2.9 |
| Upper Valley | 2.6 |
| Forebay | 2.7 |
| Pressure | 5.7 |
| Eastside | 3.1 |
| Arroyo Seco | 1.0 |

### Table ES-5b: Benefit Matrix for Modification of Nacimiento Spillway

| Area | Ratio |
|---|---|
| Extended Upper Valley - Above Dam | 4.0 |
| Extended Upper Valley - Below Dam | 2.8 |
| Upper Valley | 2.3 |
| Forebay | 2.5 |
| Pressure | 6.3 |
| Eastside | 4.8 |
| Arroyo Seco | 1.0 |

## Table ES-5c: Proposed Benefit Matrix for Salinas River Diversion Facility

| Area | Ratio |
|---|---|
| Extended Upper Valley - Above Dam | 0.0 |
| Extended Upper Valley - Below Dam | 0.0 |
| Upper Valley | 0.0 |
| Forebay | 0.0 |
| Pressure | 1.2 |
| Eastside | 1.0 |
| Arroyo Seco | 0.0 |

**Proposed Assessments**

The proposed assessments have been established by utilizing the ratios presented in Tables ES-5a through ES-5c, and multiplying those relative ratios by the total assessment amount required for each of the three project components – operations and maintenance of Nacimiento and San Antonio Reservoirs, construction of the modification to the Nacimiento Spillway, and construction of the Salinas River Diversion Facility. The estimated annual costs are presented in Table ES-1.

In addition to the costs shown in Table ES-1, there is an annual cost of $273,000 associated with assessment administration. This cost is shared equally throughout Zone 2C based on the active/passive use of land associated with each parcel. The proposed assessment administration assessments have been established by utilizing the equivalent acreage for each land use.

The annual operations and maintenance cost associated with the Salinas River Diversion Facility will be recovered through water delivery charges to the recipients of the delivered water, e.g., there is a user's fee for utilizing the diverted water for irrigation. Those charges will be levied to water users in existing Zone 2B as a water delivery charge.

The annual operations and maintenance costs associated with the modified spillway at Nacimiento Dam are included in the Nacimiento and San Antonio Reservoirs operations and maintenance costs.

The proposed assessments are shown in Table ES-6.

## Table ES-6: Estimated Assessments for Zone 2C

| Zone | Operations | Spillway | Diversion | Total Special Assessment | Assessment Administration | Total Assessment per Acre |
|---|---|---|---|---|---|---|
| **Extended Upper Valley Above Dam** | | | | | | |
| Irrigated Agriculture | $ 7.04 | $ 1.82 | $ - | $ 8.86 | $ 1.03 | $ 9.89 |
| Residential (1-4 Units) | $ 7.04 | $ 1.82 | $ - | $ 8.86 | $ 1.03 | $ 9.89 |
| Apartments (over 4 Units), Commercial | $ 7.04 | $ 1.82 | $ - | $ 8.86 | $ 1.03 | $ 9.89 |
| Institutional Land | $ 7.04 | $ 1.82 | $ - | $ 8.86 | $ 1.03 | $ 9.89 |
| Industrial Land | $ 7.04 | $ 1.82 | $ - | $ 8.86 | $ 1.03 | $ 9.89 |
| Dry Farming, Grazing, and Vacant Lot | $ 0.70 | $ 0.18 | $ - | $ 0.88 | $ 0.10 | $ 0.98 |
| River Channels and Lands with Frequent Flooding | $ 0.07 | $ 0.02 | $ - | $ 0.09 | $ 0.01 | $ 0.10 |
| Land Receiving No Charge | $ - | $ - | $ - | $ - | $ - | $ - |
| **Extended Upper Valley Below Dam** | | | | | | |
| Irrigated Agriculture | $ 7.55 | $ 1.28 | $ - | $ 8.83 | $ 1.03 | $ 9.86 |
| Residential (1-4 Units) | $ 7.55 | $ 1.28 | $ - | $ 8.83 | $ 1.03 | $ 9.86 |
| Apartments (over 4 Units), Commercial | $ 7.55 | $ 1.28 | $ - | $ 8.83 | $ 1.03 | $ 9.86 |
| Institutional Land | $ 7.55 | $ 1.28 | $ - | $ 8.83 | $ 1.03 | $ 9.86 |
| Industrial Land | $ 7.55 | $ 1.28 | $ - | $ 8.83 | $ 1.03 | $ 9.86 |
| Dry Farming, Grazing, and Vacant Lot | $ 0.76 | $ 0.13 | $ - | $ 0.89 | $ 0.10 | $ 0.99 |
| River Channels and Lands with Frequent Flooding | $ 0.08 | $ 0.01 | $ - | $ 0.09 | $ 0.01 | $ 0.10 |
| Land Receiving No Charge | $ - | $ - | $ - | $ - | $ - | $ - |
| **Upper Valley** | | | | | | |
| Irrigated Agriculture | $ 6.77 | $ 1.05 | $ - | $ 7.82 | $ 1.03 | $ 8.85 |
| Residential (1-4 Units) | $ 6.77 | $ 1.05 | $ - | $ 7.82 | $ 1.03 | $ 8.85 |
| Apartments (over 4 Units), Commercial | $ 6.77 | $ 1.05 | $ - | $ 7.82 | $ 1.03 | $ 8.85 |
| Institutional Land | $ 6.77 | $ 1.05 | $ - | $ 7.82 | $ 1.03 | $ 8.85 |
| Industrial Land | $ 6.77 | $ 1.05 | $ - | $ 7.82 | $ 1.03 | $ 8.85 |
| Dry Farming, Grazing, and Vacant Lot | $ 0.68 | $ 0.10 | $ - | $ 0.78 | $ 0.10 | $ 0.88 |
| River Channels and Lands with Frequent Flooding | $ 0.07 | $ 0.01 | $ - | $ 0.08 | $ 0.01 | $ 0.09 |
| Land Receiving No Charge | $ - | $ - | $ - | $ - | $ - | $ - |
| **Forebay** | | | | | | |
| Irrigated Agriculture | $ 7.03 | $ 1.14 | $ - | $ 8.17 | $ 1.03 | $ 9.20 |
| Residential (1-4 Units) | $ 7.03 | $ 1.14 | $ - | $ 8.17 | $ 1.03 | $ 9.20 |
| Apartments (over 4 Units), Commercial | $ 7.03 | $ 1.14 | $ - | $ 8.17 | $ 1.03 | $ 9.20 |
| Institutional Land | $ 7.03 | $ 1.14 | $ - | $ 8.17 | $ 1.03 | $ 9.20 |
| Industrial Land | $ 7.03 | $ 1.14 | $ - | $ 8.17 | $ 1.03 | $ 9.20 |
| Dry Farming, Grazing, and Vacant Lot | $ 0.70 | $ 0.11 | $ - | $ 0.81 | $ 0.10 | $ 0.91 |
| River Channels and Lands with Frequent Flooding | $ 0.07 | $ 0.01 | $ - | $ 0.08 | $ 0.01 | $ 0.09 |
| Land Receiving No Charge | $ - | $ - | $ - | $ - | $ - | $ - |
| **Pressure** | | | | | | |
| Irrigated Agriculture | $ 14.85 | $ 2.87 | $ 6.18 | $ 23.90 | $ 1.03 | $ 24.93 |
| Residential (1-4 Units) | $ 14.85 | $ 2.87 | $ 6.18 | $ 23.90 | $ 1.03 | $ 24.93 |
| Apartments (over 4 Units), Commercial | $ 14.85 | $ 2.87 | $ 6.18 | $ 23.90 | $ 1.03 | $ 24.93 |
| Institutional Land | $ 14.85 | $ 2.87 | $ 6.18 | $ 23.90 | $ 1.03 | $ 24.93 |
| Industrial Land | $ 14.85 | $ 2.87 | $ 6.18 | $ 23.90 | $ 1.03 | $ 24.93 |
| Dry Farming, Grazing, and Vacant Lot | $ 1.48 | $ 0.29 | $ 0.62 | $ 2.39 | $ 0.10 | $ 2.49 |
| River Channels and Lands with Frequent Flooding | $ 0.15 | $ 0.03 | $ 0.06 | $ 0.24 | $ 0.01 | $ 0.25 |
| Land Receiving No Charge | $ - | $ - | $ - | $ - | $ - | $ - |
| **East Side** | | | | | | |
| Irrigated Agriculture | $ 8.07 | $ 2.19 | $ 5.15 | $ 15.41 | $ 1.03 | $ 16.44 |
| Residential (1-4 Units) | $ 8.07 | $ 2.19 | $ 5.15 | $ 15.41 | $ 1.03 | $ 16.44 |
| Apartments (over 4 Units), Commercial | $ 8.07 | $ 2.19 | $ 5.15 | $ 15.41 | $ 1.03 | $ 16.44 |
| Institutional Land | $ 8.07 | $ 2.19 | $ 5.15 | $ 15.41 | $ 1.03 | $ 16.44 |
| Industrial Land | $ 8.07 | $ 2.19 | $ 5.15 | $ 15.41 | $ 1.03 | $ 16.44 |
| Dry Farming, Grazing, and Vacant Lot | $ 0.81 | $ 0.22 | $ 0.52 | $ 1.55 | $ 0.10 | $ 1.65 |
| River Channels and Lands with Frequent Flooding | $ 0.08 | $ 0.02 | $ 0.05 | $ 0.15 | $ 0.01 | $ 0.16 |
| Land Receiving No Charge | $ - | $ - | $ - | $ - | $ - | $ - |
| **Arroyo Seco** | | | | | | |
| Irrigated Agriculture | $ 2.60 | $ 0.46 | $ - | $ 3.06 | $ 1.03 | $ 4.09 |
| Residential (1-4 Units) | $ 2.60 | $ 0.46 | $ - | $ 3.06 | $ 1.03 | $ 4.09 |
| Apartments (over 4 Units), Commercial | $ 2.60 | $ 0.46 | $ - | $ 3.06 | $ 1.03 | $ 4.09 |
| Institutional Land | $ 2.60 | $ 0.46 | $ - | $ 3.06 | $ 1.03 | $ 4.09 |
| Industrial Land | $ 2.60 | $ 0.46 | $ - | $ 3.06 | $ 1.03 | $ 4.09 |
| Dry Farming, Grazing, and Vacant Lot | $ 0.26 | $ 0.05 | $ - | $ 0.31 | $ 0.10 | $ 0.41 |
| River Channels and Lands with Frequent Flooding | $ 0.03 | $ - | $ - | $ 0.03 | $ 0.01 | $ 0.04 |
| Land Receiving No Charge | $ - | $ - | $ - | $ - | $ - | $ - |

# 1
# Introduction

# 1 Introduction

Groundwater is the major source of water in the Salinas Valley. Groundwater demands currently exceed groundwater recharge, resulting in an overdraft condition. This basin overdraft has resulted in declining groundwater levels and seawater intrusion, which have become serious concerns for the Salinas Valley. In an effort to halt overdraft and provide a hydrologically balanced basin, the Monterey County Water Resource Agency (MCWRA) is in the process of implementing the recommended project components described in the Salinas Valley Water Project (SVWP) Final Environmental Impact Report/Environmental Impact Statement (EIR/EIS) (2002) and the Salinas Valley Water Project Summary Report (2002). These project components are described more fully in Section 2 of this Engineer's Report.

The SVWP will allow MCWRA to meet its water supply goals for the Salinas Valley. The combined goals of the SVWP are:

- Halting seawater intrusion;
- Continuing conservation of winter flows for recharge of the Salinas Valley basin through summer releases;
- Providing flood protection;
- Improving long-term hydrologic balance between recharge and withdrawal; and
- Providing a sufficient water supply to meet water needs through the year 2030.

MCWRA certified the EIR for the project on June 4, 2002, and final certification of the EIS is expected in early 2003. A major implementation element for the proposed projects and the topic of this Engineer's Report is the development of a financing plan for the capital improvements, the annual operation and maintenance (O&M) costs for those improvements, and the annual operations and maintenance costs of the existing facilities. In order to develop a fair and equitable funding strategy, a Cost Allocation Committee (CAC) was formed to assist in developing an assessment structure for the proposed project. The CAC evaluated various funding structures through public forums and meetings held from September 2001 through November 2002. Through that process, it has been concluded that an appropriate source of funding for the proposed improvements and annual O&M costs would be a combination of land-based assessments and water delivery charges.

Proposition 218, which was adopted in 1996, requires that the people who would be required to pay a new or increased assessment approve that assessment before a public agency is permitted to levy the assessment. For an assessment to be approved there must be a majority yes vote of the submitted ballots on a cost assessed basis. In other words, each vote is multiplied by its dollar assessment, and to obtain approval, the majority of votes cast times their respective dollar assessments must be greater than the product of the no votes times their relative dollar assessments.

## 1.1 Purpose of Engineer's Report

The purpose of this Engineer's Report is to document the assessment methodology prepared by MCWRA in support of a ballot measure to approve funding of the proposed project, as required by Proposition 218. The Engineer's Report only addresses allocation of benefits for the purpose of funding the proposed project under the provisions of Proposition 218; it does not attempt, in anyway, to address questions relating to water rights. This report includes documentation of the assessment methodology, delineation of the zones of benefit, and the assessment roll.

This Engineer's Report is organized into the following sections:

**Section 1 – Introduction.** This section describes the need for the proposed project and the purpose of this Engineer's Report. In addition, this section presents the organization of the report.

**Section 2 – Project Description.** This section is a summary of the existing facilities, proposed capital improvements presented in the SVWP Final EIR/EIS, and estimated costs of the proposed project.

**Section 3 – Assessment Methodology.** This section describes the assessment methodology used to develop the assessment roll for the Proposition 218 Special Assessment election.

**Section 4 – References**

# 2
# Project Description

# 2 Project Description

This section is a summary description of the existing MCWRA facilities and its operations and the proposed SVWP project facilities and its operations. The proposed project would halt seawater intrusion, provide flood protection, eliminate overdraft, and create new water supplies for the Salinas Valley. In addition, the proposed project would provide additional flood protection while allowing for continued maximum beneficial use of Nacimiento Reservoir.

For purposes of this Engineer's Report, the SVWP includes:

- Operations and maintenance of the existing facilities;
- Modification of the spillway at Nacimiento Dam; and
- The Salinas River Diversion Facility (SRDF).

Operation and maintenance of the existing facilities is presently funded through the Standby and Availability Charges associated with MCWRA Special Benefit Zones 2 and 2A. The operation and maintenance of those facilities has been included in the project definition since, if approved, the proposed assessments described in this Engineer's Report would replace the Standby and Availability Charges associated with MCWRA Special Benefit Zones 2 and 2A.

## 2.1 Existing Facilities

MCWRA has operated and maintained the Nacimiento and San Antonio reservoirs since they became operational in 1957 and 1967, respectively. The operation of both reservoirs has been, and continues to be, for two primary functions: flood control and water conservation (i.e., storage and regulated release of runoff for groundwater recharge along the Salinas River channel). Other incidental benefits, such as recreation, are also provided by both reservoirs. Nacimiento Reservoir has a maximum capacity of 377,900 acre-feet (AF) and a maximum surface elevation of 800 feet. San Antonio Reservoir has a maximum capacity of 335,000 AF and a maximum surface elevation of 780 feet.

## 2.2 Proposed Project

The proposed project consists of three distinct components, operations and maintenance of the existing reservoirs, construction of the Nacimiento Dam Spillway Modifications, and construction of the Salinas River Surface Diversion Facility. The proposed project will meet the identified project goals. The following sections provide a brief description of each project component and summarize general design criteria used to develop each component.

### 2.2.1 Operation and Maintenance of Nacimiento and San Antonio Reservoirs

This project component provides for continued operation and maintenance of the two existing reservoirs. This component includes direct operations and maintenance of the existing facilities, along with the associated activities of maintenance of the Salinas River channel, Salinas River mouth, cloud seeding, debris clearing, data collection and management, and other administrative tasks. The incremental cost associated with operating and maintaining the modified spillway at Nacimiento Dam is also included in this project component.

The existing operation of the two reservoirs is focused on two objectives: providing flood protection and providing conservation of winter flows for release during the summer months. As such, the reservoirs are operated based on "rule curves" that establish minimum flood pool requirements necessary to provide an adequate level of flood protection. Stored winter flows are released during the summer season, with the MCWRA's objective to increase stream recharge by maintaining flow to an approximate location of the Davis Road crossing of the Salinas River.

The proposed spillway modifications at Nacimiento Dam would allow changes in the way both reservoirs are operated, resulting in additional water for surface diversion and/or groundwater recharge, assuring the provision of adequate flood control capacity, and maximizing conservation releases. The increased flexibility that would be afforded by the proposed spillway modification would be especially evident during the late winter and early spring when Nacimiento Reservoir levels have historically been maintained at a maximum elevation of 777 feet (per the currently accepted rule curve) for flood control operation and to accommodate existing spillway capacity. During normal and heavier rainfall years, this has meant that MCWRA was forced to release water from the reservoir that could otherwise have been stored for conservation (i.e., recharge) uses later in the year during the late-spring/summer months. By increasing the capacity of the spillway and reoperating Nacimiento Reservoir, more water can be stored during the winter/spring, while still passing the PMF, thus making more water available for release later in the year.

Reoperation would involve changes in the amount, frequency, and schedule for releases of water from the reservoirs into the Nacimiento and San Antonio rivers connecting to the Salinas River, and would not involve physical improvements. Although no physical modifications are required or are being proposed at San Antonio Reservoir, the operation and management of the reservoirs by MCWRA are influenced by each other. Therefore, a change in operation at Nacimiento Dam translates into a change in operation at San Antonio Dam.

Based on the hydraulic modeling conducted for the SVWP, it was determined that reoperation of both reservoirs (assuming implementation of the spillway modifications at Nacimiento) could increase the water available for surface diversion and/or groundwater recharge. Specifically, the proposed reoperation would result in approximately 29,000 AFY (average over hydrologic record) of additional stored water that would be available for conservation releases (i.e., recharge of the groundwater aquifers) and downstream diversion.

Under the proposed project, releases from Nacimiento would be lower during the winter months. This is primarily the result of the increased spillway capacity, as well as no diversion requirement at the proposed Salinas River Diversion Facility (SRDF) at Moro Cojo, during the winter months. Higher release requirements for diversion and recharge during the irrigation months would result in increased releases of up to nearly 11,000 AF per month for the April through August period.

Releases from San Antonio Reservoir under the proposed project would generally be higher during the summer months than under existing conditions. Reoperation would also increase the releases from San Antonio Reservoir during the irrigation months to enhance groundwater recharge and meet diversion requirements. During the winter and early spring months, a reduction in releases would occur under the proposed action. The proposed project allows releases for recharge and diversion during the April thru October period.

## 2.2.2 Nacimiento Dam Spillway Modifications

A spillway modification is needed at Nacimiento Dam, to address lack of capacity to pass the Probable Maximum Flood (PMF) event. The SVWP takes advantage of the spillway modification, to provide greater flexibility and operational storage in the existing reservoir.

Nacimiento Dam's spillway structure was evaluated in the 1980's by MCWRA at the request of the California Department of Water Resources Division of Safety of Dams (DSOD) and the Federal Energy Regulatory Commission (FERC). The evaluation was required to determine the capacity of the dam structure to safely pass a PMF event. The PMF is a measure used to evaluate the dam spillway capacity to prevent catastrophic failure of the dam under extreme meteorologic conditions. Recently, MCWRA retained GEI Consultants, Inc. (GEI) to conduct additional PMF capacity analyses, and to prepare recommendations for the physical modifications necessary to meet DSOD and FERC requirements. The GEI study was prepared under the guidance and review of MCWRA through its Reservoir Operations Committee.

GEI found that spillway modifications were required at Nacimiento in order to safely pass the revised PMF. The only alternative to modifying the reservoir spillway is to lower the operating rule curve to provide the level of additional storage required to attenuate a PMF event within the reservoir and prevent overtopping of the dam structure. The option of lowering the rule curve would reduce the effective water conservation storage capacity of Nacimiento Reservoir by approximately 124,000 acre-feet (out of a total of 377,900 AF), and was therefore not considered to be a viable alternative. Upon completion of the spillway modifications, MCWRA would comply with DSOD safety requirements, as well as gain additional flexibility in the operation of Nacimiento Reservoir. This flexibility allows for reoperation of the reservoir, one of the key components of the proposed project.

The proposed project calls for modifying the existing spillway by lowering the spillway crest and installing an inflatable rubber dam. Figure 2-1 shows the existing spillway. The modification to Nacimiento Reservoir includes lowering the concrete ogee spillway 8 feet. Lowering the crest would require the excavation and removal of more than 1,000 cubic yards of concrete. The spillway crest would then be prepared and finished with concrete to accommodate the installation of an inflatable rubber dam. The sidewalls of the downstream spillway chute would need to be raised to accommodate the increased flows that could pass through the modified spillway. The structure would be installed such that the current maximum storage level of 800 feet elevation would be maintained.

To pass the PMF, the rubber dam would be deflated, increasing the capacity of the spillway. Once the peak of the event hydrograph has passed, or late in the winter season, the rubber dam would be inflated to allow the reservoir water levels to return to the full storage capacity of Nacimiento Reservoir. Implementation of this component would not increase the existing maximum lake level (i.e., maximum inundation area surrounding the lake) of elevation 800 feet.

The inflatable rubber dam would be a custom-made structure that would be anchored to the new spillway concrete foundation. Two rubber dam sections, each approximately 75 feet in length, would be installed across the 150-foot spillway crest. A cross section of the rubber dam is shown in Figure 2-2. The inflatable dams would be raised by compressed air. An air pipe inflation system would be installed, consisting of an air supply and exhaust pipe, upstream water level sensor pipe, and inner pressure sensor pipe. It would take approximately 20-40 minutes to fully inflate the rubber dam. Deflation would be rapid. Inflation and deflation could be accomplished automatically and by remote or local control. Automatic safety devices would be installed to protect the dam from damage should any of the other

control mechanisms fail. Final design of the facility would be subject to the review and approval of DSOD and FERC.

The spillway modifications allows for greater operating flexibility through modification to the existing flood rule curve to store water in the late winter and spring months. This additional water storage would be released from Nacimiento for Basin recharge and downstream diversion later in the year.

### 2.2.3 Salinas River Surface Diversion Facility

The proposed project includes conveyance water released from the two reservoirs and diversion of that water at the proposed Salinas River Diversion Facility (SRDF). The proposed operations would involve: (1) conveyance of water from San Antonio and Nacimiento reservoirs via the Salinas River, (2) seasonal (April to October) confinement of water behind a proposed in-stream inflatable diversion structure, and (3) diversion of up to 12,800 AFY of water into the existing Castroville Seawater Intrusion Project (CSIP) distribution pipeline where it would be blended with recycled water produced at the Monterey County Water Recycling Projects facility and delivered to agricultural users for irrigation. The location of the SRDF and the existing CSIP system is shown on Figure 2-3.

Delivery of water from the Salinas River to replace groundwater pumping in the area suffering from seawater intrusion has long been considered a potential component in solving the Basin's groundwater problems. With the listing in 1997 of the steelhead as a federally threatened species under the Endangered Species Act, however, this component brings new environmental considerations for MCWRA. A remnant of steelhead runs the Salinas River mainstream for migration to spawning habitat in the Arroyo Seco and potentially in the Upper Salinas River. The proposed in-stream surface diversion facility will be designed to minimize potential impacts to steelhead.

The SRDF would be constructed within the Salinas River channel, approximately two miles upstream of Highway 1 near Moro Cojo at the approximate location of the Salinas River crossing of the CSIP distribution pipeline. The diversion facility would impound river water behind the dam during those times of the year when the dam is in operation (April-October). The dam would create a body of water within the existing river channel. Up to 12,800 AFY of water would be diverted from the river by pumping directly into the existing CSIP pipeline. It then would be delivered to agricultural users within the CSIP service area.

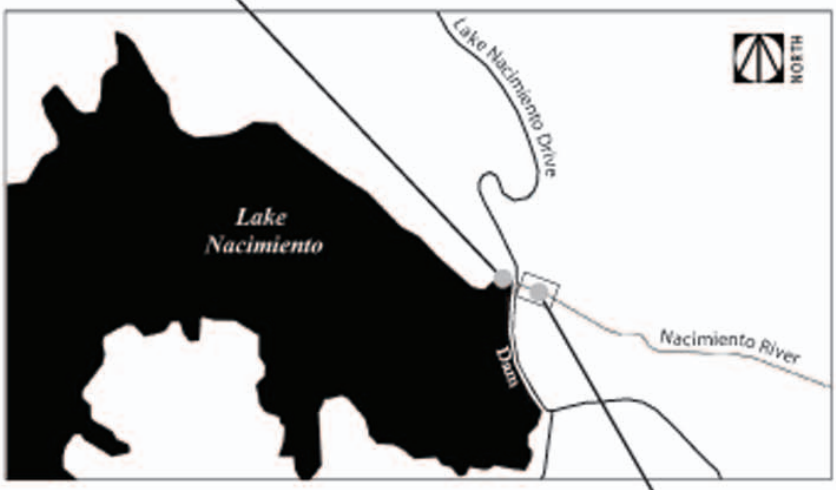
The diversion of water from the Salinas River to the CSIP distribution pipeline will include the following features:

- Diversion Dam Structure
- Fish Screen Diversion
- Fish Ladder
- Salinas River Pump Station and CSIP Interconnection Pipeline

A schematic of the SRDF is included in Figure 2-4.

The diversion structure would incorporate an Obermeyer Spillway gate approximately 230 feet in length. The height of the spillway gate would be controlled with an inflatable air bladder. The diversion structure foundation would be constructed of reinforced concrete with vinyl sheet piles driven at the upstream and downstream ends. Vinyl sheet piles are proposed to avoid deterioration by corrosion, which would occur with steel. The upstream sheet piles would serve as a hydraulic cutoff to prevent piping under the structure and undermining the foundation. The downstream sheet piles would serve as a structural cutoff to protect the foundation from being undercut by scouring.

Spillway from upstream side of dam (looking east)

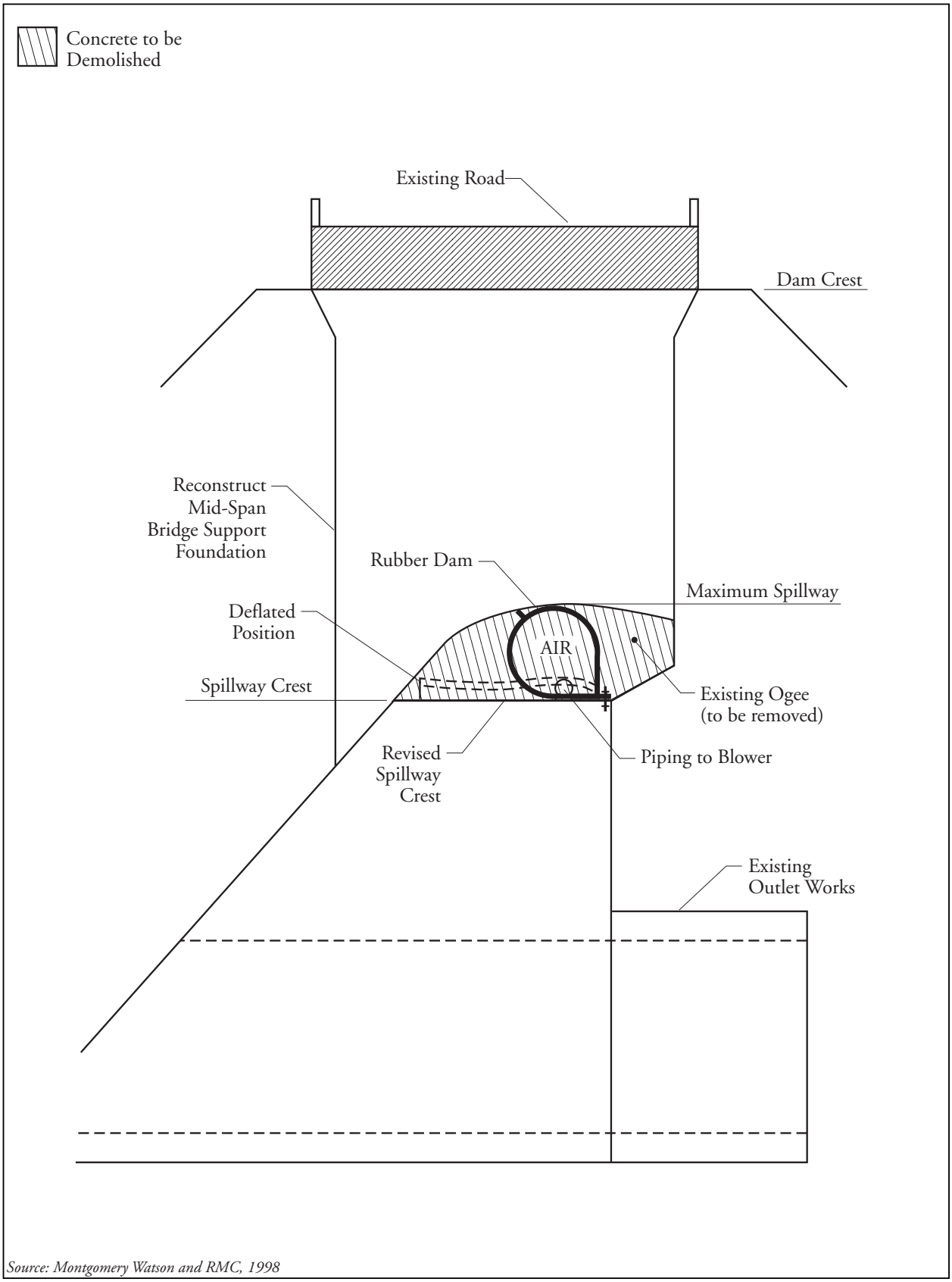



Spillway chute (looking north)

*Source: EDAW, Inc. 1998; Montgomery Watson, 1998.*

**Existing Nacimiento Spillway Structure**

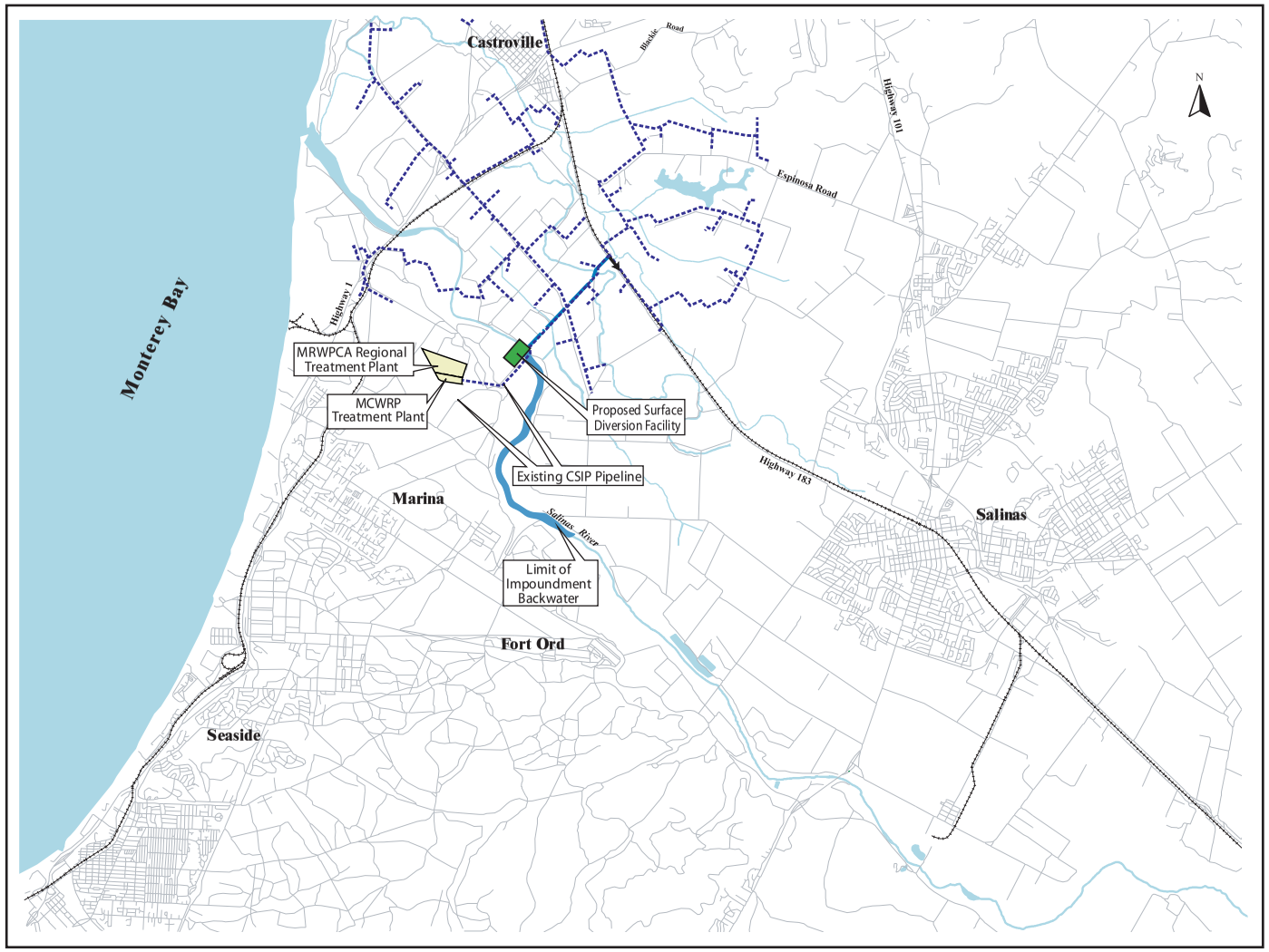
Figure 2-1




*Source: Montgomery Watson and RMC, 1998*

**Rubber Dam at the Nacimiento Spillway**

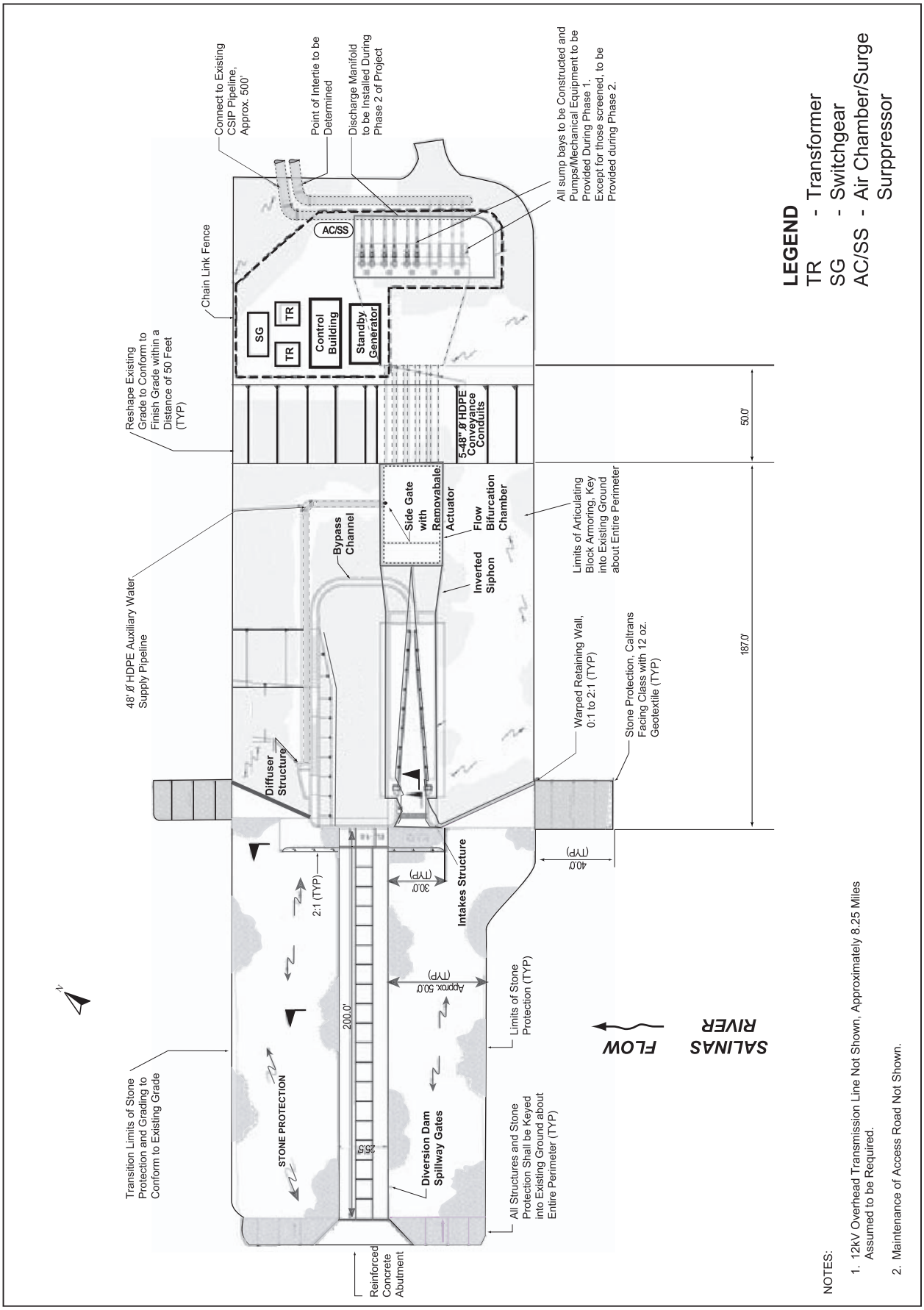
Figure 2-2




*Source: MCWRA 1997, Montgomery Watson 1997, EDAW 1999, and RMC 2002.*

**Salinas River Diversion and Current CSIP Facility**

Figure 2-3




Plan View of the Salamis River Diversion Facility

Figure 2-4

*Source: Borcalli & Associates, Inc., 2001*

The gates would be fully raised at the beginning of the diversion season. As documented in the Biological Assessment for the Salinas Valley Water Project – Salinas River, California (2002), the proposed seasonal operation of the diversion structure is as follows:

- November 1 - March 31 - Gates lowered and no water diverted.
- April 1 - May 31 - Gates raised, bypassing 45 cfs through the fish ladder with the Salinas River Lagoon open, bypassing 15 cfs through the fish ladder with the Salinas River Lagoon closed, and diverting up to 85 cfs.
- June 1 - October 31 - Gates raised, bypassing 15 cfs through the fish ladder with the Salinas River Lagoon closed or open, and diverting up to 85 cfs.

The fish screen would be designed to comply with the criteria of the National Marine Fisheries Service (NMFS) and the California Department of Fish and Game (CDFG) for steelhead. The fish screen and fish ladder would be designed as a single hydraulic unit in that the bypass flows for fish passage through the ladder would provide the sweeping velocities across the screen face. Final design parameters would be reviewed with the respective agencies for concurrence in advance of design.

Based upon the current agricultural operation in the CSIP service area, the pump station operation may need to be limited or stopped for up to 6 hours (late at night) in a 24-hour period. The impoundment created by the diversion structure would be operated to provide flexibility in the water delivery, while minimizing spills at the diversion structure. The top 1 foot of the impoundment provides approximately 85 acre-feet of storage. This volume is equivalent to approximately 12 hours of the pump station operation at 85 cfs. By drawing down the impoundment by 0.5 to 1 foot at the end of the pump station operations, the impoundment would be allowed to recover during the pump station down time.

## 2.3 Cost Estimate of Proposed Project Components

The cost for of the three-project component is presented in Table 2-1.

Annualized capital costs were developed using an interest rate of 5% and a 30-year recovery period.

**Operation and Maintenance of the Reservoirs (Reoperations)**

There is no capital cost associated with reoperation and maintenance of the reservoirs. However, the estimated annual operation and maintenance (O&M) cost of the reservoirs is $2.37 million. This estimate is based on the MCWRA 2003 operations budget, as detailed in Appendix A.

**Nacimiento Spillway Modifications (Spillway)**

The estimated capital cost for the spillway modifications is $7.30 million. The construction costs were developed by GEI Consultants, Inc (GEI 2002). The remaining capital costs were developed by the MCWRA. A summary of these costs is included in Appendix A. The annual O&M for the spillway modifications is interrelated with the reoperation of the reservoirs, and therefore is included with the annual O&M for reoperation of the reservoirs.

The annualized capital cost for the spillway improvements is $0.47 million.

**Salinas River Surface Diversion Facility (Diversion)**

The estimated capital cost for the diversion project is $11.50 million. Construction costs are based on Salinas River Diversion Facility Project Description prepared by Borcalli & Associates (Borcalli 2002). The remaining capital costs were developed by the MCWRA. A summary of these costs is included in Appendix A. Operation and maintenance costs of the diversion facility will not be recovered through the benefit assessments, but will be recovered through a water delivery charge to those receiving delivered project water within Zone 2B.

The total annual cost of the diversion project is $0.75 million.

Finally, there is an estimated annual cost of $273,000 associated with assessment administration. A summary of these costs is included in Appendix A. The overall annual cost of the project is $3.86 million.

## Table 2-1: Project Components Estimated Cost

| Project Component | Total Capital Costs ($ Millions) | Total Annual O&M Costs ($ Millions) | Total Estimate Annual Cost ($ Millions) |
|---|---|---|---|
| Reservoir Operations and Maintenance | $0 | $2.37 | $2.37 |
| Nacimiento Dam Spillway Modifications | $7.30 | $0 | $0.47 |
| Salinas River Diversion Facility | $11.50 | $0 | $0.75 |
| **Total** | **$18.80** | **$2.37** | **$3.59** |
| Assessment Administration | $0 | $0.27 | $0.27 |
| **Overall Total** | **$18.80** | **$2.64** | **$3.86** |

Notes:
1. All costs are based on August 2002 San Francisco ENR CCI of 7657.
2. Annualized costs are based on a 30-year capital recovery period at 5% interest.
3. All cost estimates are rounded to the nearest $10,000.
4. Capital Costs include engineering, construction, construction management, and financing for each component.
5. O&M costs associated with the Nacimiento Dam Spillway Modifications are included in the Reservoir Operations and Maintenance costs.
6. O&M costs associated with the Salinas River Diversion Facility will be recovered through a water delivery charge to be paid by the users.

# 3
# Assessment Methodology

# 3 Assessment Methodology

The purpose of this section is to summarize the process that MCWRA used to develop a new assessment to fund the implementation of the SVWP.

**Assessment Committee**

The Assessment Committee (Committee) was a committee of the Salinas Valley interests that was originally formed by order of Judge Silver as part of the Orradre et al. vs. MCWRA litigation. The committee was charged with the responsibility to develop a new and proportional form of assessment(s) to replace the existing Zone 2 and 2A uniform water standby charges. In considering new forms of assessment(s), the original committee was to take into account the extent to which MCWRA makes water available to the assessed land, the reduction of overdraft, the prevention of seawater intrusion, and any other water availability, flood control, groundwater quality and other benefits conferred on the assessed lands.

The original Committee was comprised of representatives from the following groups[1]:

- Orradre et al litigants;
- Castroville Agricultural Water Coalition;
- Eastside Water Alliance;
- Salinas Valley Water Coalition;
- Tanimura & Antle/Bunn;
- Cal-Water Company; and
- MCWRA.

The original Committee was unable to meet its objective, and the issue returned to court where Judge Silver upheld the validity of the existing Zones 2 and 2A assessments. The remaining members of this group continued to meet, and decided to broaden membership and include groups from other Salinas Valley interests, such as urban areas. The additional participants included:

- City of Salinas;
- City of Marina[2];
- Marina Coast Water District; and
- City of Greenfield.

One of the main focuses of the group was to develop assessment strategies that would be used by MCWRA. The group was charged with developing strategies that would be technically based, equitable, and reflect an understandable allocation of the benefits of MCWRA's projects. The new assessment strategy must conform to the requirements of the California Constitution as amended by Proposition 218. Proposition 218 requires that a land based assessment must be levied based on the benefit received from the project, and each parcel would pay an assessment based on the level of benefit received from the project.

A Technical Sub-Committee (Technical Committee) was formed based on Judge Silver's order. One purpose for the Technical Committee was to recommend a new boundary for the proposed zone of benefit. The Technical Committee members were Dennis Williams, Joe Scalmanini, and Lyndel Melton (Peter Pyle was invited to participate, but declined).

[1] Ultimately the Orradre et al representative chose to not participate in the process
[2] The City of Marina joined the group late in the process

The Committee (and its Technical Committee), concluded its efforts in early 2001, and presented a summary of its conclusions to the MCWRA Board of Directors in a July 16, 2001 letter.

**Cost Allocation Committee**

The MCWRA Board of Directors formed a Cost Allocation Committee (CAC) on July 23, 2001. The purpose of the CAC was to develop and present to MCWRA Board of Directors a basis for assessment for the benefits received from the proposed SVWP that fully complies with the provisions of Proposition 218. The CAC has met regularly over the last year to develop and finalize a set of recommendations for an assessment to finance the SVWP.

The membership of the CAC shown in Table 3-1 is as follows.

**Table 3-1: Cost Allocation Committee Membership**

| | | | |
|---|---|---|---|
| Dan Anderson | – Forebay | Steve Jensen | – East Side Alliance |
| Bob Antle | – Pressure Area | Jim Manassero | – East Side Alliance |
| Mike Armstrong | – Urban Community | Bob Martin | – Forebay |
| Chris Bunn | – Pressure Area | Roger Moitoso | – Upper Valley |
| Don Chapin, Jr. | – North Monterey County | Arvid Myhre | – Upper Valley |
| Carl Chase | – North Monterey County | Greg O'Neal | – Pressure Area |
| Jan Collins | – Urban Community | Jim Perrine | – Urban Community |
| Matt Gourley | – Urban Community | Rich Smith | – Arroyo Seco |
| Chris Indelicato | – Upper Valley | Jim Smith | – Urban Community |
| Nancy Isakson | – Arroyo Seco | | |

**Assessment Methodology**

The CAC reviewed the recommendations from the Committee as part of its initial work. The CAC refined the recommendations by the Committee for both the zone boundaries and the benefit matrix. Those refinements and recommendations are presented below.

## 3.1 Benefit Zone Definition

The first step in developing the assessment was the identification of the assessment zone, or benefit zone, namely the area that would benefit from operation of the two reservoirs and construction of the proposed project. A new assessment zone, Zone 2C, was identified and proposed for creation, as required by Proposition 218, to include the lands that receive special benefit from the proposed SVWP. These benefits are deemed special benefits and therefore only those parcels that receive the special benefit are expected to fund the project.

The proposed zone of benefit (Zone 2C) has been defined based on geological conditions and hydrologic factors, which define and limit the benefits derived from the reservoirs. The proposed zone is separated into seven major hydrologic sub-areas that receive various levels of benefits.

The Zone 2C boundary, shown in Figure 3-1, was reviewed and approved by the members of the original Technical Committee (Dennis Williams, Joe Scalmanini, and Lyndel Melton). The basis for inclusion of lands within Zone 2C is:

1. There must be a hydro-geologic or flood protection basis for establishing benefit;

2. The zone of hydrologic benefits is defined as land overlying water bearing alluvium that has hydraulic continuity with the Salinas River;

3. The zone of benefits excludes narrow, likely shallow, channels off the main basin where pumping can not induce an up-gradient recharge;

4. Existing annexations, such as the Chalone Valley that are non-hydraulically connected have been included since they are receiving benefits through physically installed pumping and piping equipment;

5. The southern boundary of the zone of benefit is defined by the Monterey/San Luis Obispo County line;

6. Lands immediately adjacent to San Antonio reservoir receive hydrologic benefits due to recharge of the underlying aquifer and receive recreational benefits afforded by their proximity to San Antonio reservoir;

7. The boundary in the Fort Ord area is defined by the existing 2A boundary. Work completed for the Army by Harding Lawson Associates clearly demonstrates the boundary of the hydraulically connected alluvium is approximated by the existing Zone 2A delineation;

8. Any contiguous parcel that overlies a portion of the alluvial material that is in hydrologic continuity with the Salinas River has been included in Zone 2C since the overlying portion of the parcel provides access to all hydrologic benefits;

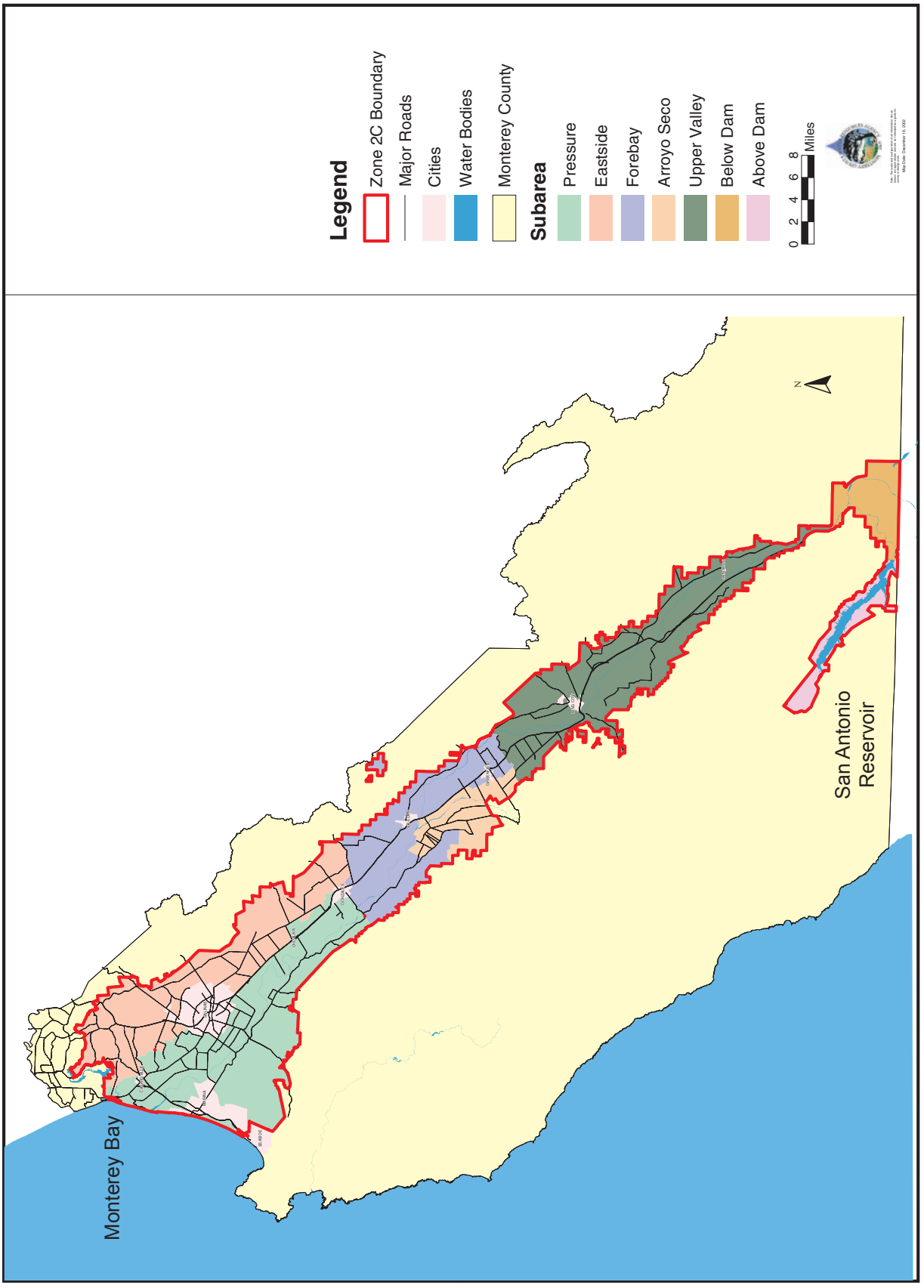
Historic work has shown there to be five distinct sub-areas within the Salinas Valley Basin. Those sub-areas were first identified in DWR Bulletin 52, and include:

- Upper Valley
- Forebay
- Pressure
- East Side
- Arroyo Seco

Historic work has further shown that each of the sub-areas within the Salinas Valley is hydraulically connected, but due to their varying geology and geography, they receive varying levels of benefits from the operation of the two existing reservoirs. Many of those same bodies of work have shown that the benefits that could be derived from the proposed SVWP facilities would also vary by geographic location within the Salinas Valley.

The Technical Committee reviewed the sub-area delineations established in DWR Bulletin 52, and determined that there is information that supports those delineations and there is no known contradictory information. However, a review of the geology of the Salinas Valley indicates water-bearing alluvium extends south of the Upper Valley area, as delineated in DWR Bulletin 52, to beyond the Monterey/San Luis Obispo County line. This alluvium also extends west from the Salinas River area to the area surrounding San Antonio Reservoir.

It was concluded that the proposed Zone 2C should encompass the entire area within the Salinas Valley and Monterey County that overlies water bearing alluvium. Therefore, the proposed Zone 2C boundary extends to the Monterey/San Luis Obispo County line and west to the area surrounding San Antonio Reservoir.




**Proposed Zone 2 C**

Figure 3-1

*Source: MCWRA 12-02*

There is, however, one area that, although it is hydraulically connected, does not receive appreciable recharge from the Salinas River. A portion of the upper Arroyo Seco Cone area is not being recharged in any appreciable manner by the Salinas River due to the predominance of recharge resulting from the Arroyo Seco River. Average annual flow in the Arroyo Seco River is approximately 40 percent of average annual flow in the Salinas River. This predominance of flow from the Arroyo Seco River precludes flow in the Salinas River from recharging the upper portion of the Arroyo Seco Cone even though the area is in hydraulic continuity with the alluvium of the Salinas Valley. Water quality testing, the results of which are included in Appendix B, confirms this observation and shows a chemical characteristic of the groundwater of the upper Arroyo Seco Cone area in both drought and non-drought conditions that is quite distinct from the chemical "signature" of Salinas River water. Because of these differences the Agency has concluded that this area does not benefit from the operation of the existing reservoirs, and is therefore not included in Zone 2C.

The seven benefit sub-areas (sub-areas) identified for inclusion in Zone 2C are shown on Figure 3-1 and listed below:

- Extended Upper Valley Above Dam
- Extended Upper Valley Below Dam
- Upper Valley
- Forebay
- Pressure
- East Side
- Arroyo Seco

## 3.2 Definition of Benefit

The proposed assessment is based upon the concept that the benefits received from the proposed SVWP are determined by two factors. The first factor measures the water supply and flood protection benefits. The second factor is dependent upon the whether the land owner is actively or passively utilizing the land.

### 3.2.1 Water Supply and Flood Protection Benefits

Seawater intrusion was identified as a significant problem in the Salinas Valley in the 1940's. The DWR issued Bulletin 52, Salinas Basin Investigation, in 1946 to address the increasing seawater intrusion problem. Bulletin 52, along with subsequent studies, lead to implementation of a series of projects in the Salinas Valley aimed at addressing water supply, groundwater overdraft, and seawater intrusion. The construction of Nacimiento and San Antonio Reservoirs were the first projects to be implemented.

The two primary purposes of Nacimiento and San Antonio reservoirs are providing flood protection and water conservation. Flood protection is achieved through storage of river flows to reduce the peak flows downstream of the reservoirs. The reduction in flows results in decreased frequency and magnitude of flooding. Analysis has been performed to quantify the level of flood protection benefit received due to the reservoirs. The reduction in flood damage is estimated to be approximately $10 million per year.

The second purpose for the reservoirs is water conservation storage. Water stored in the reservoirs would otherwise be lost to Monterey Bay. With the reservoirs in place, water is collected during the wet weather season for release during the dry weather season. The stored water is released to increase groundwater recharge in the Salinas Valley. Increase in groundwater recharge results in a number of benefits, including increased groundwater levels, reduction of seawater intrusion, improved general groundwater quality, drought protection, preservation of aquifer storage, and timing and location of recharge in relation to the timing and location of groundwater pumping. Using the same analysis that was performed for

flood protection, it was estimated that groundwater storage has been increased by an average of 30,000 acre-feet per year (AFY). The analysis estimated that seawater intrusion rates were reduced by 7,000 AFY due to the increase in groundwater recharge and storage.

The reservoirs are multi-use facilities and in addition to the primary purposes described previously, recreational opportunities are created. Both the Nacimiento and San Antonio Reservoirs have provided recreational opportunities since the reservoirs began operation.

The Technical Committee developed a list of special benefits provided by the SVWP. The benefits are a result of achieving the goals of the SVWP. The CAC reviewed the list of benefits recommended by the Technical Committee and concurred with the recommendations presented in the Engineer's Report.

The water supply and flood protection benefits provided by the reservoirs are not equal. Some benefits are secondary benefits that occur due to providing the primary benefits. To account for this, a weighting factor was assigned to each of the benefits to distinguish the level of benefit received.

The following discussion documents the specific benefits received by lands residing in Zone 2C. The benefits result in varying degrees from each of the three components. The weighting factor for each of the benefits is also included.

**Control of Seawater Intrusion**

The SVWP provides the benefit of reducing/halting seawater intrusion. Modification of the spillway and operation and maintenance components preserves the same level of benefit toward the reduction in seawater intrusion as is currently received. Construction of the SRDF increases this benefit by providing direct delivery of Salinas River water to Zone 2B for blending with recycled water. By providing an alternate source of water for irrigation, dependence on groundwater will be reduced. Seawater intrusion during the winter months will be eliminated and significantly reduced in the summer months. The average annual rate of subsurface outflow to the ocean under existing water use conditions with the SVWP in place would be approximately 900 AFY, as compared to present estimate of seawater intrusion at a rate of approximately 8,900 AFY.

The reduction of seawater intrusion is the primary goal of the SVWP. To account for the importance of this benefit in relation to the other benefits, a weighting factor of 3 was assigned.

**Flood Control**

Nacimiento and San Antonio Reservoirs will continue to provide flood protection benefits. The SVWP ensures that the reservoirs provide protection against the revised PMF event that can be expected to occur. All parcels will continue to receive the same level of protection that exists today.

Flood protection is one of the two primary purposes of the two existing reservoirs. The operation and maintenance component preserves this benefit. Both the modification of the spillway and the SRDF has no impact on the ability of the reservoirs to provide the benefit of flood protection.

To account for the importance of the flood protection to meet the overall goals of the SVWP, a weighting factor of 3 was assigned.

**Increased Groundwater Recharge**

Increase in groundwater recharge is a result of increased stream flows during the summer irrigation season when the combination of stream flow and groundwater conditions allow greater recharge. Operation and maintenance of the existing reservoirs preserves the existing benefit of increased recharge of approximately 30,000 AFY.

Modification of the spillway and operation and maintenance components preserves the same level of benefit toward the increase of groundwater recharge as is currently received. Construction of the SRDF increases this benefit by providing direct delivery of Salinas River water to Zone 2B to reduce groundwater pumping. Under existing water use conditions with the SVWP in place, groundwater recharge would increase by approximately 2,500 AFY.

Because groundwater recharge is a secondary and not a primary project objective, this benefit is not as important as the reduction of seawater intrusion or providing flood protection. The resulting weighting factor assigned to increased groundwater recharge is 1.

**Groundwater Quality**

The existing operation of the two reservoirs provides a benefit of enhanced groundwater quality throughout a majority of the basin. Groundwater quality is generally enhanced through increased recharge of high quality Salinas River water. Additionally, the higher groundwater levels that result from the increased levels of recharge serve to reduce the flow of poorer quality groundwater that is present at the boundary of a portion of the Salinas Valley Basin.

Operation and maintenance of the existing reservoirs provides this benefit, while construction of the spillway modification preserves it. Construction of the SRDF has little or no benefit to general groundwater quality.

Because the improvement in groundwater quality is a secondary and not a primary objective of the SVWP, a weighting factor of 1 was assigned.

**Timing and Location of the Recharge**

The Nacimiento and San Antonio reservoirs are operated to allow storage of winter runoff and then release it in the irrigation and post-irrigation season when the recharge potential is highest. The irrigation and post irrigation seasons occur in April to October, which are the warmer, drier months of the year. When water is released during this time, it recharges the aquifer at a time when the aquifer would not normally be recharged (no rainfall) and when groundwater pumping is at its greatest. Groundwater levels would be lower during the irrigation season if water was not released from the reservoirs for groundwater recharge. Therefore, one of the benefits of the reservoir operations is the timing and location of stream recharge along the Salinas River.

Operation and maintenance of the existing reservoirs provides this benefit, while construction of the spillway modification preserves it. Construction of the SRDF has little or no impact to the timing and location of recharge.

Because this is not a primary objective of the project, a weighting factor of 1 was assigned.

**Drought Protection**

Drought protection is provided by the existing reservoirs through reservoir releases during dry years and through increased levels of groundwater storage. During historical drought periods, water was released from the reservoirs, providing flow in the Salinas River for recharge during periods when natural runoff would not have occurred. The approximate 30,000 AFY of additional groundwater recharge has resulted in a net increase in groundwater storage of more than 1,000,000 AF of water. The SVWP will increase groundwater recharge adding to the groundwater storage that can be used for drought protection.

Operation and maintenance of the existing reservoirs provides this benefit, while construction of the spillway modification preserves it. Construction of the SRDF has little or no benefit to drought protection.

Because drought protection is a result of reducing seawater intrusion, a weighting factor of 1 was assigned.

**Preservation of Aquifer Storage**

The release of water from the reservoirs recharges the groundwater aquifer, and thus prevents seawater from entering into the aquifer storage space, resulting in preservation of aquifer storage. As the groundwater levels increase, the existing aquifers will be protected against seawater intrusion and will continue to be able to provide water.

Operation and maintenance of the existing reservoirs provides this benefit, while construction of the spillway modification preserves it. The SRDF will result in a further reduction in seawater intrusion and a further preservation of aquifer storage.

A weighting factor of 1 was assigned to this benefit.

**Recreation**

Nacimiento and San Antonio Reservoirs provide recreational opportunities to residents. The parcels surrounding San Antonio reservoir receive a direct benefit from the recreational opportunities afforded by those parcels being adjacent to the reservoir.

Operation and maintenance of the reservoirs provides this benefit, while modification of the spillway serves to preserve this benefit by allowing the MCWRA to store more water in Nacimiento Reservoir in the winter months, thus allowing San Antonio reservoir to be maintained at a higher water surface elevation.

Because recreation is a secondary benefit, a weighting factor of 1 was assigned.

A summary of the Water Supply and Flood Protection Benefits, including weighting factors, is presented in Table 3-2.

### Table 3-2: Special Benefits

| Special Benefit | Weighting Factor |
|---|---|
| Control of Seawater Intrusion | 3 |
| Flood Control | 3 |
| Increased Recharge | 1 |
| Groundwater Quality | 1 |
| Timing and Location of Recharge | 1 |
| Drought Protection | 1 |
| Preservation of Aquifer Storage | 1 |
| Recreation | 1 |

## 3.2.2 Active/Passive Use of Land

Monterey County is the jurisdictional agency responsible for designating land use within the county. The county has agricultural, residential, commercial, industrial, open space, and other land uses. These land uses would not all receive the same benefits from the project. The assessment considers land use because of the varying levels of benefit attributed to each land use. For instance, an acre of commercial land is expected to have a higher benefit from the project than an acre of open space because the commercial land is actively being used. Each land use has a distinct benefit from the project and requires a unique assessment according to the benefits that would be received from the project.

Land use factors were assigned based on whether the land is actively or passively used. Active use of the land means the land owner has put the land to its potential use, with the highest potential uses being residential, apartments, commercial, industrial, institutional, and irrigated agricultural uses. Dry farming, grazing, vacant lot, lands subject to frequent flooding, and native (lands receiving no charge) lands are lower levels of use of land, or more passive uses. Land use factors of 0.1 and 0.01 were assigned, respectively, for these more passive uses of land, consistent with the existing assessment methodology utilized for Zones 2 and 2A. The Passive/Active use of land factors are summarized in Table 3-3.

### Table 3-3: Proposed Active/Passive Use of Land

| Land Use | Active/Passive Use of Land Factors |
|---|---|
| Irrigated Agriculture (Baseline) | 1 |
| Residential (1-4 Units) | 1 |
| Apartments (over 4 Units), Commercial | 1 |
| Institutional Land | 1 |
| Industrial Land | 1 |
| Dry Farming, Grazing, and Vacant Lot | 0.1 |
| River Channels and Lands with Frequent Flooding | 0.01 |
| Land Receiving No Charge | 0 |

In addition to the factors in Table 3-3 the assessment guidelines in Table 3-4 were used to assess parcels with special land uses or unique land conditions. These unique conditions include parcels with multiple land uses, parcels bordering multiple benefit zones, parcels on the border of the benefit zone, and other unique land use considerations. The guidelines also classified special land uses into appropriate assessment categories.

## Table 3-4: Assessment Guidelines

| No. | Condition | Guideline |
|---|---|---|
| 1 | All Residential type parcels single family, multi-family, suburban residential, mobile home park, condominiums. | All residential parcels to be assessed equally by acreage while meeting Guideline No. 2. |
| 2 | Residential Parcel with an area less than 1 acre. | Assessed at actual acreage to a minimum of 1/8 per acre |
| 3 | Residential Parcel bordering multiple benefit zones. | Parcel to be assessed in the zone of highest benefit. |
| 4 | Residential Parcel bordering benefit zone (portion of parcel outside benefit zone). | If area within benefit zone is greater than 1/16th of an acre, the whole parcel shall be assessed according to the benefit zone it falls in. |
| 5 | Mobile Home Park | Assessed as one parcel |
| 6 | Vacant Lots | Assessed according to land use designation. |
| 7 | Agricultural Parcels bordering multiple benefit zones. | Parcel area divided into multiple areas corresponding to area in each benefit zone. Parcel assessed according to subareas in each benefit zone. |
| 8 | Agricultural Parcels bordering benefit zone (portion of parcel outside benefit zone). | Parcel with area(s) in the benefit zone to be assessed according to acreage of the parcel within zone. |
| 9 | Agricultural Parcels with undevelopable land such as wetlands, riparian habitat, or other protected habitat. | Parcel to be assessed by subtracting out undevelopable area. |
| 10 | Open Space | Open Space is not developable and therefore carries no assessment. |
| 11 | Wetlands, riparian habitat, or other protected habitat | Assessed according to River Channels and Lands with Frequent Flooding. |
| 12 | Special Cases (such as Schools, Fire station, Library, Community Centers, Churches, Golf Courses) | To be assessed as a residential parcel according to acreage and all residential guidelines. |

MCWRA developed parcel information, including land use, acreage, zone, and other data. This data was used as the basis for the assessment. Land use acreages for each zone are summarized in Table 3-5.

## Table 3-5: Zone Land Use Acreages

| Land Use | Extended Upper Valley Above Dam | Extended Upper Valley Below Dam | Upper Valley | Forebay | Pressure | East Side | Arroyo Seco |
|---|---|---|---|---|---|---|---|
| Irrigated Agriculture | 0 | 1,763 | 58,139 | 39,373 | 54,817 | 40,162 | 17,749 |
| Residential (1-4 Units) | 0 | 61 | 1,978 | 1,525 | 4,992 | 16,544 | 372 |
| Apartments (over 4 Units), Commercial | 0 | 3 | 251 | 358 | 1,835 | 1,434 | 257 |
| Institutional Land | 0 | 0 | 183 | 86 | 585 | 158 | 21 |
| Industrial Land | 0 | 0 | 434 | 1,414 | 2,469 | 1,225 | 1 |
| Dry Farming, Grazing, and Vacant Lot | 17,993 | 18,947 | 30,733 | 15,581 | 48,220 | 26,510 | 3,471 |
| River Channels and Lands with Frequent Flooding | 0 | 0 | 6,202 | 1,618 | 757 | 111 | 453 |
| Land Receiving No Charge | 0 | 21 | 1,120 | 604 | 477 | 363 | 66 |
| **Total** | **17,993** | **20,795** | **99,039** | **60,559** | **114,152** | **86,507** | **22,390** |

## 3.2.3 Benefit Evaluation

The level of benefit received in each sub-area was established through a series of evaluations. First, the CAC utilized the findings of the Technical Committee relative to operation of the two existing reservoirs were used as a basis to identify and assign benefit factors for each of the SVWP components within each of the sub-areas. The Technical Committee utilized a process wherein each of the three active members evaluated each benefit criterion by sub-area to identify a relative benefit ranking for each benefit criteria and sub-area. Their individual benefit rankings, which were prepared independently, were quite similar; the minor differences in the relative benefit ranking for each criterion for each sub-area were, therefore, easily resolved. Through this approach, the Technical Committee developed a recommended ranking of benefits by sub-area.

The relative benefit rankings developed by the Technical Committee were refined by the CAC. The resulting benefit factors for each criterion by sub-area are presented in Tables 3-6a, 3-6b, and 3-6c, respectively, for each of the three project components.

### Table 3-6a: Operations Benefits

| Benefit | Extended Upper Valley Above Dam | Extended Upper Valley Below Dam | Upper Valley | Forebay | Pressure | East Side | Arroyo Seco |
|---|---|---|---|---|---|---|---|
| Control of Seawater Intrusion | 0 | 0 | 0 | 0 | 5 | 4 | 0 |
| Flood Control | 1 | 3 | 3 | 3 | 5 | 1 | 1 |
| Increased Recharge | 1 | 1 | 1 | 3 | 3 | 2 | 1 |
| Groundwater Quality | 2 | 3 | 3 | 2 | 0 | 0 | 0 |
| Timing and Location of Recharge | 5 | 4 | 2 | 2 | 1 | 0 | 1 |
| Drought Protection | 5 | 3 | 3 | 3 | 2 | 2 | 2 |
| Preservation of Aquifer Storage | 0 | 0 | 0 | 0 | 4 | 3 | 0 |
| Recreation | 3 | 0 | 0 | 0 | 0 | 0 | 0 |

### Table 3-6b: Spillway Benefits

| Benefit | Extended Upper Valley Above Dam | Extended Upper Valley Below Dam | Upper Valley | Forebay | Pressure | East Side | Arroyo Seco |
|---|---|---|---|---|---|---|---|
| Control of Seawater Intrusion | 0 | 0 | 0 | 0 | 5 | 4 | 0 |
| Flood Control | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Increased Recharge | 1 | 1 | 1 | 3 | 3 | 2 | 1 |
| Groundwater Quality | 2 | 3 | 3 | 2 | 0 | 0 | 0 |
| Timing and Location of Recharge | 5 | 4 | 2 | 2 | 1 | 0 | 1 |
| Drought Protection | 5 | 3 | 3 | 3 | 2 | 2 | 2 |
| Preservation of Aquifer Storage | 0 | 0 | 0 | 0 | 4 | 3 | 0 |
| Recreation | 3 | 0 | 0 | 0 | 0 | 0 | 0 |

## Table 3-6c: Diversion Benefits

| Benefit | Extended Upper Valley Above Dam | Extended Upper Valley Below Dam | Upper Valley | Forebay | Pressure | East Side | Arroyo Seco |
|---|---|---|---|---|---|---|---|
| Control of Seawater Intrusion | 0 | 0 | 0 | 0 | 5 | 4 | 0 |
| Flood Control | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Increased Recharge | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| Groundwater Quality | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Timing and Location of Recharge | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Drought Protection | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Preservation of Aquifer Storage | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| Recreation | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

The benefit factor was multiplied by the weighting factor for each of the benefits to calculate the weighted benefit factor:

Weighted Benefit Factor = Benefit Factor x Weighting Factor

Tables 3-6d, 3-6e, and 3-6f present the weighted benefit factor for each of the zones for each of the project components.

## Table 3-6d: Operations Weighted Benefits

| Benefit | Weighting Factor | Extended Upper Valley Above Dam | Extended Upper Valley Below Dam | Upper Valley | Forebay | Pressure | East Side | Arroyo Seco |
|---|---|---|---|---|---|---|---|---|
| Control of Seawater Intrusion | 3 | 0 | 0 | 0 | 0 | 15 | 12 | 0 |
| Flood Control | 3 | 3 | 9 | 9 | 9 | 15 | 3 | 3 |
| Increased Recharge | 1 | 1 | 1 | 1 | 3 | 3 | 2 | 1 |
| Groundwater Quality | 1 | 2 | 3 | 3 | 2 | 0 | 0 | 0 |
| Timing and Location of Recharge | 1 | 5 | 4 | 2 | 2 | 1 | 0 | 1 |
| Drought Protection | 1 | 5 | 3 | 3 | 3 | 2 | 2 | 2 |
| Preservation of Aquifer Storage | 1 | 0 | 0 | 0 | 0 | 4 | 3 | 0 |
| Recreation | 1 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total** | | **19** | **20** | **18** | **19** | **40** | **22** | **7** |

## Table 3-6e: Spillway Weighted Benefits

| Benefit | Weighting Factor | Extended Upper Valley Above Dam | Extended Upper Valley Below Dam | Upper Valley | Forebay | Pressure | East Side | Arroyo Seco |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| Control of Seawater Intrusion | 3 | 0 | 0 | 0 | 0 | 15 | 12 | 0 |
| Flood Control | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Increased Recharge | 1 | 1 | 1 | 1 | 3 | 3 | 2 | 1 |
| Groundwater Quality | 1 | 2 | 3 | 3 | 2 | 0 | 0 | 0 |
| Timing and Location of Recharge | 1 | 5 | 4 | 2 | 2 | 1 | 0 | 1 |
| Drought Protection | 1 | 5 | 3 | 3 | 3 | 2 | 2 | 2 |
| Preservation of Aquifer Storage | 1 | 0 | 0 | 0 | 0 | 4 | 3 | 0 |
| Recreation | 1 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total** | | **16** | **11** | **9** | **10** | **25** | **19** | **4** |

## Table 3-6f: Diversion Weighted Benefits

| Benefit | Weighting Factor | Extended Upper Valley Above Dam | Extended Upper Valley Below Dam | Upper Valley | Forebay | Pressure | East Side | Arroyo Seco |
|---|---|---|---|---|---|---|---|---|
| Control of Seawater Intrusion | 3 | 0 | 0 | 0 | 0 | 15 | 12 | 0 |
| Flood Control | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Increased Recharge | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| Groundwater Quality | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Timing and Location of Recharge | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Drought Protection | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Preservation of Aquifer Storage | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| Recreation | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total** | | **0** | **0** | **0** | **0** | **17** | **14** | **0** |

The final step was to calculate the benefit ratio for each sub-area by project component. The benefit ratio defines the expected benefit received for a particular sub-area. A benefit ratio was calculated for each of the sub-areas for each of the project components.

The sub-area with the least total benefit was used as a basis for establishing the relative total benefit received in each of the sub-areas. This is accomplished by dividing the total benefit in each sub-area by the total benefit of the sub-area with the least total benefit or baseline sub-area:

Benefit Ratio = (Weighted Benefit Factor for X Sub-area)/(Weighted Benefit Factor for Baseline Sub-area)

The least total benefit for operations and maintenance and modification of the spillway occurs in the Arroyo Seco sub-area, with the total benefit 7 for operation and maintenance of the existing reservoirs and 4 for modification of the spillway.

For construction of the Salinas River Diversion Facility, benefits are received in the Pressure and East Side sub-areas only. The East-Side sub-area receives a total benefit of 14 for construction of the Salinas River Diversion Facility.

The benefit ratios for each of the sub-areas for each project component is presented in Table 3-7.

**Table 3-7: Benefit Ratios**

| Sub-area | Operations | Spillway | Diversion |
|---|---|---|---|
| Extended Upper Valley Above | 2.7 | 4 | 0.0 |
| Extended Upper Valley Below | 2.9 | 2.8 | 0.0 |
| Upper Valley | 2.6 | 2.3 | 0.0 |
| Forebay | 2.7 | 2.5 | 0.0 |
| Pressure | 5.7 | 6.3 | 1.2 |
| East Side | 3.1 | 4.8 | 1.0 |
| Arroyo Seco | 1 | 1 | 0.0 |

## 3.3 Cost Allocation Methodology

Overall project costs were allocated to the sub-areas according to the benefit and land use of each zone. This section details the procedure used to allocate these costs.

The first step in the allocation process was calculation of equivalent agricultural acreage for each sub-area. As discussed in Section 3.2.2, land use is one of two factors used to calculate the benefits received by each parcel. Providing water to agricultural users was identified as the most efficient way to meet the goals of the SVWP. All lands that are actively used similar to agricultural land, receive similar benefit. Using the land use factors described earlier, acreage for each of the land uses is converted to equivalent agriculture acreage.

The equivalent agricultural acreage is the product of the actual acreage and the land use factors, which converts the actual acreages to an equivalent agricultural acreage. The equivalent agricultural acreage of each land use was calculated by multiplying the land use acreage by the land use factor:

Equivalent Agricultural Acreage = (Land Use 'X' acreage) * (Land Use Factor)

Table 3-8 summarizes the equivalent agricultural acreage calculation for the Upper Valley benefit zone.

## Table 3-8: Equivalent Agricultural Acreage Calculation for Upper Valley

| Land Use | Upper Valley | | |
|---|---|---|---|
| | Land Use Factor | Acreage[1] | Equivalent Agricultural Acreage[2] |
| Irrigated Agriculture (Baseline) | 1 | 58,139 | 58,139 |
| Residential (1-4 Units) | 1 | 1,978 | 1,978 |
| Apartments (over 4 Units), Commercial | 1 | 251 | 251 |
| Institutional Land | 1 | 183 | 183 |
| Industrial Land | 1 | 434 | 434 |
| Dry Farming, Grazing, and Vacant Lot | 0.1 | 30,733 | 3,073 |
| River Channels and Lands with Frequent Flooding | 0.01 | 6,202 | 62 |
| Land Receiving No Charge | 0 | 1,120 | 0 |
| **Total** | | **99,040** | **64,119** |

Footnote:
1. This acreage is the assessed acreage and may be less than the actual acreage of the parcel.
2. Equivalent acres have been rounded to the nearest acre.

This equivalent agricultural acreage calculation was completed for each zone and is presented in Table 3-9.

## Table 3-9: Total Equivalent Agricultural Acreages

| Land Use | Extended Upper Valley Above Dam | Extended Upper Valley Below Dam | Upper Valley | Forebay | Pressure | East Side | Arroyo Seco |
|---|---|---|---|---|---|---|---|
| Irrigated Agriculture | 0 | 1,763 | 58,139 | 39,373 | 54,817 | 40,162 | 17,749 |
| Residential (1-4 Units) | 0 | 61 | 1,978 | 1,525 | 4,992 | 16,544 | 372 |
| Apartments (over 4 Units), Commercial | 0 | 3 | 251 | 358 | 1,835 | 1,434 | 257 |
| Institutional Land | 0 | 0 | 183 | 86 | 585 | 158 | 21 |
| Industrial Land | 0 | 0 | 434 | 1,414 | 2,469 | 1,225 | 1 |
| Dry Farming, Grazing, and Vacant Lot | 1,799 | 1,895 | 3,073 | 1,558 | 4,822 | 2,651 | 347 |
| River Channels and Lands with Frequent Flooding | 0 | 0 | 62 | 16 | 8 | 1 | 5 |
| Land Receiving No Charge | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total** | **1,799** | **3,722** | **64,119** | **44,330** | **69,528** | **62,175** | **18,752** |

The next step was the development of a cost share factor for each sub-area and each project element. The cost share factor was calculated as the benefit ratio multiplied by the total equivalent agriculture acreage for each project element (i):

$$\text{Cost Share Factor}_{(i = \text{Re-Operations, Spillway, Diversion})} = (\text{Benefit Ratios}_{(i)}) * (\text{Total Equivalent Agricultural Acreage})$$

Subsequently, a cost share ratio for each sub-area was calculated as the cost share factor divided by the sum ("Σ") of the cost share factors for each project element:

$$\text{Cost Share Ratio}_{(i = \text{Re-Operations, Spillway, Diversion})} = \frac{(\text{Cost Share Factor}_{(i)})}{(\Sigma \text{ Cost Share Factor}_{(i)})}$$

Table 3-10 illustrates the calculation of the cost share factors and ratios.

## Table 3-10: Cost Share Factors and Ratios

| Zone | Total Equivalent Agricultural Acreage | Operations | | | Spillway | | | Diversion | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Benefit Ratio | Cost Share Factor | Cost Share Ratio | Benefit Ratio | Cost Share Factor | Cost Share Ratio | Benefit Ratio | Cost Share Factor | Cost Share Ratio |
| Ext. Upper Valley Above Dam | 1,799 | 2.7 | 4,860 | 0.01 | 4.0 | 7,200 | 0.01 | 0.0 | 0 | 0.00 |
| Ext. Upper Valley Below Dam | 3,722 | 2.9 | 10,790 | 0.01 | 2.8 | 10,420 | 0.01 | 0.0 | 0 | 0.00 |
| Upper Valley | 64,119 | 2.6 | 166,710 | 0.18 | 2.3 | 147,470 | 0.14 | 0.0 | 0 | 0.00 |
| Forebay | 44,330 | 2.7 | 119,690 | 0.13 | 2.5 | 110,830 | 0.11 | 0.0 | 0 | 0.00 |
| Pressure | 69,528 | 5.7 | 396,310 | 0.44 | 6.3 | 438,020 | 0.42 | 1.2 | 83,430 | 0.57 |
| East Side | 62,175 | 3.1 | 192,740 | 0.21 | 4.8 | 298,440 | 0.29 | 1.0 | 62,170 | 0.43 |
| Arroyo Seco – | 18,752 | 1.0 | 18,750 | 0.02 | 1.0 | 18,750 | 0.02 | 0.0 | 0 | 0.00 |
| **Cost Share Factor** | | | **909,850** | **1.00** | | **1,031,130** | **1.00** | | **145,600** | **1.00** |

The cost allocation to each sub-area was then calculated by multiplying the cost share ratio by the project element cost:

$$\text{Cost Allocation}_{(i = \text{Re-Operations, Spillway, Diversion})} = (\text{Cost Share Ratio}) * (\text{Project Element Cost}_{(i)})$$

The total cost allocation to each sub-area was the sum of the allocated project element costs and was calculated with the following equation.

$$\text{Total Cost Allocation} = \text{Cost Allocation}_{(\text{Re-Operations})} + \text{Cost Allocation}_{(\text{Spillway})} + \text{Cost Allocation}_{(\text{Diversion})}$$

Table 3-11 summarizes the overall cost allocation for each zone and the unit assessment per equivalent agricultural acre.

### Table 3-11: Cost Allocation and Total Cost to Benefit Zones

| Zone | Operations $2,370,000[1] | | Spillway $470,000[2] | | Diversion $750,000[3] | | Total Cost Allocation |
|---|---|---|---|---|---|---|---|
| | Cost Share Ratio | Cost Allocation | Cost Share Ratio | Cost Allocation | Cost Share Ratio | Cost Allocation | |
| Extended Upper Valley Above Dam | 0.01 | $12,659 | 0.01 | $3,282 | 0.00 | $0 | **$15,941** |
| Extended Upper Valley Below Dam | 0.01 | $28,106 | 0.01 | $4,750 | 0.00 | $0 | **$32,856** |
| Upper Valley | 0.18 | $434,250 | 0.14 | $67,219 | 0.00 | $0 | **$501,469** |
| Forebay | 0.13 | $311,772 | 0.11 | $50,517 | 0.00 | $0 | **$362,289** |
| Pressure | 0.44 | $1,032,318 | 0.42 | $199,654 | 0.57 | $429,756 | **$1,661,728** |
| East Side | 0.21 | $502,054 | 0.29 | $136,032 | 0.43 | $320,244 | **$958,330** |
| Arroyo Seco | 0.02 | $48,840 | 0.02 | $8,546 | 0.00 | $0 | **$57,386** |
| **Total Cost** | **1.00** | **$2,370,000** | **1.00** | **$470,000** | **1.00** | **$750,000** | **$3,590,000** |

Footnotes:
1. Total annualized costs for re-operation of San Antonio and Nacimiento Reservoirs including operation of rubber dam facility
2. Total annualized capital cost for Nacimiento Reservoir Spillway Modifications
3. Total annualized capital cost for Salinas River Diversion Facility

## 3.4 Assessment Rates

A baseline unit assessment per acre of agricultural land was calculated using the total cost allocation divided by the total equivalent agricultural acreage.

Unit Assessment (Baseline Rate) = (Total Cost Allocation) / (Equivalent Agriculture Acreage)

Unit assessment for the other land uses were then calculated according to the land use factors multiplied by the baseline rate for each zone.

Unit Assessment (Land Use 'X') = (Land Use Factor 'X') * (Baseline Rate)

The unit assessment for each zone and land use is shown in Table 3-12.

### Table 3-12: Unit Assessment by Zone and Land Use ($/Acre)

| Land Use | Land Use Factor | Extended Upper Valley Above Dam | Extended Upper Valley Below Dam | Upper Valley | Forebay | Pressure | East Side | Arroyo Seco |
|---|---|---|---|---|---|---|---|---|
| Irrigated Agriculture (Baseline) | 1 | $8.86 | $8.83 | $7.82 | $8.17 | $23.90 | $15.41 | $3.06 |
| Residential (1-4 Units) | 1 | $8.86 | $8.83 | $7.82 | $8.17 | $23.90 | $15.41 | $3.06 |
| Apartments (over 4 Units), Commercial | 1 | $8.86 | $8.83 | $7.82 | $8.17 | $23.90 | $15.41 | $3.06 |
| Institutional Land | 1 | $8.86 | $8.83 | $7.82 | $8.17 | $23.90 | $15.41 | $3.06 |
| Industrial Land | 1 | $8.86 | $8.83 | $7.82 | $8.17 | $23.90 | $15.41 | $3.06 |
| Dry Farming, Grazing, and Vacant Lot | 0.1 | $0.88 | $0.89 | $0.78 | $0.81 | $2.39 | $1.55 | $0.31 |
| River Channels and Lands with Frequent Flooding | 0.01 | $0.09 | $0.09 | $0.08 | $0.08 | $0.24 | $0.15 | $0.03 |
| Land Receiving No Charge | 0 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 | $0.00 |

The unit assessments were used to allocate project costs to each parcel.

In addition to the costs shown in Table 3-12, there is an annual cost of $273,000 associated with assessment administration. This cost is shared equally throughout Zone 2C based on the active/passive use of land associated with each parcel. The proposed assessment administration has been established by utilizing the equivalent acreage for each land use and is presented in Table 3-13.

### Table 3-13: Assessment Administration by Land Use ($/Acre)

| Land Use | Land Use Factor | Assessment Administration |
|---|---|---|
| Irrigated Agriculture (Baseline) | 1 | $1.03 |
| Residential (1-4 Units) | 1 | $1.03 |
| Apartments (over 4 Units), Commercial | 1 | $1.03 |
| Institutional Land | 1 | $1.03 |
| Industrial Land | 1 | $1.03 |
| Dry Farming, Grazing, and Vacant Lot | 0.1 | $0.10 |
| River Channels and Lands with Frequent Flooding | 0.01 | $0.01 |
| Land Receiving No Charge | 0 | $0.00 |

The proposed assessments are shown in Table 3-14.

## Table 3-14: Estimated Assessments for Zone 2C

| Zone | Operations | Spillway | Diversion | Total Special Assessment | Assessment Administration | Total Assessment per Acre |
|---|---|---|---|---|---|---|
| **Extended Upper Valley Above Dam** | | | | | | |
| Irrigated Agriculture | $ 7.04 | $ 1.82 | $ - | $ 8.86 | $ 1.03 | $ 9.89 |
| Residential (1-4 Units) | $ 7.04 | $ 1.82 | $ - | $ 8.86 | $ 1.03 | $ 9.89 |
| Apartments (over 4 Units), Commercial | $ 7.04 | $ 1.82 | $ - | $ 8.86 | $ 1.03 | $ 9.89 |
| Institutional Land | $ 7.04 | $ 1.82 | $ - | $ 8.86 | $ 1.03 | $ 9.89 |
| Industrial Land | $ 7.04 | $ 1.82 | $ - | $ 8.86 | $ 1.03 | $ 9.89 |
| Dry Farming, Grazing, and Vacant Lot | $ 0.70 | $ 0.18 | $ - | $ 0.88 | $ 0.10 | $ 0.98 |
| River Channels and Lands with Frequent Flooding | $ 0.07 | $ 0.02 | $ - | $ 0.09 | $ 0.01 | $ 0.10 |
| Land Receiving No Charge | $ - | $ - | $ - | $ - | $ - | $ - |
| **Extended Upper Valley Below Dam** | | | | | | |
| Irrigated Agriculture | $ 7.55 | $ 1.28 | $ - | $ 8.83 | $ 1.03 | $ 9.86 |
| Residential (1-4 Units) | $ 7.55 | $ 1.28 | $ - | $ 8.83 | $ 1.03 | $ 9.86 |
| Apartments (over 4 Units), Commercial | $ 7.55 | $ 1.28 | $ - | $ 8.83 | $ 1.03 | $ 9.86 |
| Institutional Land | $ 7.55 | $ 1.28 | $ - | $ 8.83 | $ 1.03 | $ 9.86 |
| Industrial Land | $ 7.55 | $ 1.28 | $ - | $ 8.83 | $ 1.03 | $ 9.86 |
| Dry Farming, Grazing, and Vacant Lot | $ 0.76 | $ 0.13 | $ - | $ 0.89 | $ 0.10 | $ 0.99 |
| River Channels and Lands with Frequent Flooding | $ 0.08 | $ 0.01 | $ - | $ 0.09 | $ 0.01 | $ 0.10 |
| Land Receiving No Charge | $ - | $ - | $ - | $ - | $ - | $ - |
| **Upper Valley** | | | | | | |
| Irrigated Agriculture | $ 6.77 | $ 1.05 | $ - | $ 7.82 | $ 1.03 | $ 8.85 |
| Residential (1-4 Units) | $ 6.77 | $ 1.05 | $ - | $ 7.82 | $ 1.03 | $ 8.85 |
| Apartments (over 4 Units), Commercial | $ 6.77 | $ 1.05 | $ - | $ 7.82 | $ 1.03 | $ 8.85 |
| Institutional Land | $ 6.77 | $ 1.05 | $ - | $ 7.82 | $ 1.03 | $ 8.85 |
| Industrial Land | $ 6.77 | $ 1.05 | $ - | $ 7.82 | $ 1.03 | $ 8.85 |
| Dry Farming, Grazing, and Vacant Lot | $ 0.68 | $ 0.10 | $ - | $ 0.78 | $ 0.10 | $ 0.88 |
| River Channels and Lands with Frequent Flooding | $ 0.07 | $ 0.01 | $ - | $ 0.08 | $ 0.01 | $ 0.09 |
| Land Receiving No Charge | $ - | $ - | $ - | $ - | $ - | $ - |
| **Forebay** | | | | | | |
| Irrigated Agriculture | $ 7.03 | $ 1.14 | $ - | $ 8.17 | $ 1.03 | $ 9.20 |
| Residential (1-4 Units) | $ 7.03 | $ 1.14 | $ - | $ 8.17 | $ 1.03 | $ 9.20 |
| Apartments (over 4 Units), Commercial | $ 7.03 | $ 1.14 | $ - | $ 8.17 | $ 1.03 | $ 9.20 |
| Institutional Land | $ 7.03 | $ 1.14 | $ - | $ 8.17 | $ 1.03 | $ 9.20 |
| Industrial Land | $ 7.03 | $ 1.14 | $ - | $ 8.17 | $ 1.03 | $ 9.20 |
| Dry Farming, Grazing, and Vacant Lot | $ 0.70 | $ 0.11 | $ - | $ 0.81 | $ 0.10 | $ 0.91 |
| River Channels and Lands with Frequent Flooding | $ 0.07 | $ 0.01 | $ - | $ 0.08 | $ 0.01 | $ 0.09 |
| Land Receiving No Charge | $ - | $ - | $ - | $ - | $ - | $ - |
| **Pressure** | | | | | | |
| Irrigated Agriculture | $ 14.85 | $ 2.87 | $ 6.18 | $ 23.90 | $ 1.03 | $ 24.93 |
| Residential (1-4 Units) | $ 14.85 | $ 2.87 | $ 6.18 | $ 23.90 | $ 1.03 | $ 24.93 |
| Apartments (over 4 Units), Commercial | $ 14.85 | $ 2.87 | $ 6.18 | $ 23.90 | $ 1.03 | $ 24.93 |
| Institutional Land | $ 14.85 | $ 2.87 | $ 6.18 | $ 23.90 | $ 1.03 | $ 24.93 |
| Industrial Land | $ 14.85 | $ 2.87 | $ 6.18 | $ 23.90 | $ 1.03 | $ 24.93 |
| Dry Farming, Grazing, and Vacant Lot | $ 1.48 | $ 0.29 | $ 0.62 | $ 2.39 | $ 0.10 | $ 2.49 |
| River Channels and Lands with Frequent Flooding | $ 0.15 | $ 0.03 | $ 0.06 | $ 0.24 | $ 0.01 | $ 0.25 |
| Land Receiving No Charge | $ - | $ - | $ - | $ - | $ - | $ - |
| **East Side** | | | | | | |
| Irrigated Agriculture | $ 8.07 | $ 2.19 | $ 5.15 | $ 15.41 | $ 1.03 | $ 16.44 |
| Residential (1-4 Units) | $ 8.07 | $ 2.19 | $ 5.15 | $ 15.41 | $ 1.03 | $ 16.44 |
| Apartments (over 4 Units), Commercial | $ 8.07 | $ 2.19 | $ 5.15 | $ 15.41 | $ 1.03 | $ 16.44 |
| Institutional Land | $ 8.07 | $ 2.19 | $ 5.15 | $ 15.41 | $ 1.03 | $ 16.44 |
| Industrial Land | $ 8.07 | $ 2.19 | $ 5.15 | $ 15.41 | $ 1.03 | $ 16.44 |
| Dry Farming, Grazing, and Vacant Lot | $ 0.81 | $ 0.22 | $ 0.52 | $ 1.55 | $ 0.10 | $ 1.65 |
| River Channels and Lands with Frequent Flooding | $ 0.08 | $ 0.02 | $ 0.05 | $ 0.15 | $ 0.01 | $ 0.16 |
| Land Receiving No Charge | $ - | $ - | $ - | $ - | $ - | $ - |
| **Arroyo Seco** | | | | | | |
| Irrigated Agriculture | $ 2.60 | $ 0.46 | $ - | $ 3.06 | $ 1.03 | $ 4.09 |
| Residential (1-4 Units) | $ 2.60 | $ 0.46 | $ - | $ 3.06 | $ 1.03 | $ 4.09 |
| Apartments (over 4 Units), Commercial | $ 2.60 | $ 0.46 | $ - | $ 3.06 | $ 1.03 | $ 4.09 |
| Institutional Land | $ 2.60 | $ 0.46 | $ - | $ 3.06 | $ 1.03 | $ 4.09 |
| Industrial Land | $ 2.60 | $ 0.46 | $ - | $ 3.06 | $ 1.03 | $ 4.09 |
| Dry Farming, Grazing, and Vacant Lot | $ 0.26 | $ 0.05 | $ - | $ 0.31 | $ 0.10 | $ 0.41 |
| River Channels and Lands with Frequent Flooding | $ 0.03 | $ - | $ - | $ 0.03 | $ 0.01 | $ 0.04 |
| Land Receiving No Charge | $ - | $ - | $ - | $ - | $ - | $ - |

# 4
# References

# 4 References

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GEI Consultants, Inc., *Probably Maximum Flood Report for Nacimiento Reservoir*, 2001

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Montgomery Watson and Raines, Melton & Carella, Inc., *Draft Project Plan, Salinas Valley Water Project*, 1998

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Raines, Melton & Carella, Inc., *Salinas Valley Water Project Summary Report*, 2001.

# Appendices

## Table A-1: Operation and Maintenance Costs

| | | | | | EXPENDITURES | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ln # | PROGRAM NAME | Zone | Fund | Prog | Staff | Admin Staff | Services & Supplies | Consultants | Reserves | Other | Total Expenditures |
| | **ZONE 2C** | | | | | | | | | | |
| | **OPERATIONS** | | | | | | | | | | |
| 15 | Nacimiento Dam Operation & Maintenance | 2 | 205 | 9200 | 226,079 | 53,629 | 99,000 | 150,350 | 0 | 17,500 | 546,558 |
| 16 | Nacimiento Reservoir Operation Study | 2 | 205 | 9201 | 0 | 0 | 0 | 30,000 | 0 | 0 | 30,000 |
| 17a | Zone 2 Administration (Excl transf to SVWP 145k) | 2 | 205 | 9210 | 43,593 | 10,803 | 0 | 25,000 | 0 | 0 | 79,396 |
| 21 | Lake Nacimiento Debris Clearing | 2 | 205 | 9230 | 13,301 | 3,296 | 7,000 | 0 | 0 | 0 | 23,597 |
| 24 | San Antonio Dam Operation & Maintenance | 2A | 206 | 9410 | 222,324 | 52,469 | 62,000 | 52,500 | 0 | 8,500 | 397,793 |
| 25 | Zone 2A Administration | 2A | 206 | 9412 | 9,363 | 2,320 | 0 | 35,000 | 0 | 0 | 46,683 |
| 54a | Cloud Seeding | 2A | 206 | 9418 | 0 | 0 | 0 | 70,000 | 0 | 0 | 70,000 |
| 29 | Salinas River Channel | 2A | 206 | 9421 | 27,190 | 6,738 | 10,000 | 50,000 | 0 | 0 | 93,928 |
| 30 | Salinas River Mouth | 2A | 206 | 9425 | 60,056 | 14,883 | 0 | 80,000 | 0 | 0 | 154,939 |
| 31 | Reservoir Oper Hydrology & Water Quality Prog. | 2A | 206 | 9430 | 376,810 | 93,378 | 48,000 | 101,150 | 0 | 0 | 619,338 |
| 33 | ALERT Transfer Out | 2A | 206 | 9433 | 0 | 0 | 0 | 0 | 0 | 118,250 | 118,250 |
| 56 | Ground Water Extraction/Data Collection | 2A | 206 | 9458 | 106,367 | 26,359 | 5,000 | 0 | 0 | 0 | 137,726 |
| | Sub-Total Operations | | | | 1,085,083 | 263,875 | 231,000 | 594,000 | 0 | 144,250 | 2,318,208 |
| 16a/26a | Zone 2C Operating Reserve | 2 | 205 | 9205 | 0 | 0 | 0 | 0 | 50,000 | 0 | 50,000 |
| | **TOTAL OPERATIONS** | | | | 1,085,083 | 263,875 | 231,000 | 594,000 | 50,000 | 144,250 | 2,368,208 |
| | **CAMP** | | | | | | | | | | |
| 16b | Nacimiento Dam Capital Maintenance | 2 | 205 | 9208 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 22b | Nacimiento Dam CAMP | 2 | 205 | 9271 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 27 | San Antonio Dam Capital Maintenance | 2A | 206 | 9415 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 57 | San Antonio Dam CAMP | 2A | 206 | 9461 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Sub-Total CAMP Expenses | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 22b/57 | Zone 2C CAMP Reserve | 2 | 205 | 9205 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **TOTAL CAMP** | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **LEGAL** | | | | | | | | | | |
| 25d | Zone 2c Administration | 2&2A | | | 98,919 | 24,514 | 0 | 150,000 | 0 | 0 | 273,433 |
| | **TOTAL LEGAL** | | | | 98,919 | 24,514 | 0 | 150,000 | 0 | 0 | 273,433 |
| | **Total ZONE 2C** | | | | **1,184,002** | **288,389** | **231,000** | **744,000** | **50,000** | **144,250** | **2,641,641** |

Notes

1. The costs associated with the reoperations portion of the Salinas Valley Water Project are the total operations cost and do not include the costs shown on Line 25d.
2. CAMP funding are not included and will be funded from a separate source.
3. The Zone 2c Administration costs (Line 25d) are those costs estimated for the assessment administration. The consultant cost is estimated as 10% of the total staff and administrative staff budget rounded to the nearest $10,000.

# Table A-2: Capital Projects Cost Estimates

**Estimated Salinas River Diversion Facility Capital Cost[1] (2002 Dollars)**

| | | | |
|---|---|---|---|
| 1 | Land & Easement Purchase | $ 110,000 | |
| 2 | Direct Construction (Borcalli 3/20/02) | $ 6,850,000 | |
| 3 | CSIP Valve Enlargement (RMC 5/21/01 - inflated 2.5%) & Booster Upgrade | $ 670,000 | |
| 4 | Filtration - Sediment/Algae[2] | $ 420,000 | |
| 5 | Engineering (10% of Items 2, 3 and 4) | $ 800,000 | |
| 6 | Construction Management (8% of Items 2, 3 and 4) | $ 640,000 | |
| 7 | Project Administration (5% of Items 2, 3 and 4) | $ 400,000 | |
| 8 | Environmental Mitigation / Monitoring | $ 310,000 | |
| 9 | Salinas River Diversion Subtotal: | | $ 10,200,000 |
| 10 | Planning Support Repayment (5% of Capital Cost Subtotal) | | $ 510,000 |
| 11 | Estimated Capital Cost Subtotal: | | $ 10,710,000 |
| 12 | Capitalized Interest During Construction (12 mos on Bond Principal @ 5%) | | $ 580,000 |
| 13 | Finance Costs (Advisor, Underwriter, Counsel - 2% of Bond Amt) | | $ 230,000 |
| 14 | Estimated Capital + Finance Cost: | | $ 11,520,000 |
| 15 | Estimated Bond Principal Requirement | | $ 11,500,000 |
| 16 | Estimated Annual Debt Service on Bond Principal (30 yrs @ 5%) | | $ 750,000 |

**Estimated Nacimiento Dam Spillway Modification Capital Cost[3] (2002 Dollars)**

| | | | |
|---|---|---|---|
| 17 | Land & Easement Purchase | NA | |
| 18 | Direct Construction (GEI 2/11/02) | $ 5,500,000 | |
| 19 | Engineering (Primarily Funded by EDA Grant)[4] | $ 250,000 | |
| 20 | Construction Management (8% of Item 18) | $ 440,000 | |
| 21 | Project Administration (5% of Item 18) | $ 280,000 | |
| 22 | Environmental Mitigation / Monitoring[5] | $ - | |
| 23 | Nacimiento Dam Spillway Subtotal: | | $ 6,470,000 |
| 24 | Planning Support Repayment (5% of Capital Cost Subtotal) | | $ 320,000 |
| 25 | Estimated Capital Cost Subtotal: | | $ 6,790,000 |
| 26 | Capitalized Interest During Construction (12 mos on Bond Principal @ 5%) | | $ 370,000 |
| 27 | Finance Costs (Advisor, Underwriter, Counsel - 2% of Bond Amt) | | $ 150,000 |
| 28 | Estimated Capital + Finance Cost: | | $ 7,310,000 |
| 29 | Estimated Bond Principal Requirement | | $ 7,300,000 |
| 30 | Estimated Annual Debt Service on Bond Principal (30 yrs @ 5%) | | $ 470,000 |

**NOTES:**

1. 20% contingency is included in each Line Item 1 thru 8.
2. Line Item 4 includes screen filtration of sediment / algae / debris only. Disinfection or other treatment is not included.
3. 20% contingency is included in each Line Item 18 thru 21.
4. Line 19: Preliminary approval has been received from US Dept. of Commerce, Economic Delevopment Administration (EDA) for a cost-share grant for Nacimiento Dam spillway modification engineering. EDA pays 75% and MCWRA pays 25% of engineering costs to a total of $1,000,000. If the full $1,000,000 is required, EDA pays $750,000 and MCWRA pays $250,000.
5. Line Item 22 is estimated at less than $10,000 and is considered covered by contingency included in Lines 18 thru 21.
6. CSIP electric power costs will decrease due to reduced use of supplemental wells. See Line 32 detail sheet 3 of 3.
7. All estimates rounded to nearest $10,000.

# Appendix B – Water Quality Data

## Table B-1: Arroyo Seco Water Quality Data

| FACILITY_NAME | SAMPLE_DATE | ALKALINITY | CALCIUM | CHLORIDE | CONDUCTIVITY | HARDNESS | MAGNESIUM | NITRATE | PH | POTASSIUM | SODIUM | SULFATE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 18S/06E-24M01 | 4/28/1997 | 154 | 58 | 9 | 494 | | 14 | 15 | 7.2 | 2.7 | 26 | 90 |
| 18S/06E-24M02 | 7/23/1998 | 138 | 89 | 12 | 778 | | 24 | 150 | 7 | 3.1 | 27 | 99 |
| 18S/06E-25F01 | 7/3/2001 | 148 | 71 | 11 | 725 | | 19 | 111 | 7.5 | 2.9 | 46 | 101 |
| 18S/06E-25F01 | 8/8/1991 | 178 | 43 | 12 | 665 | | 12 | 38.8 | 8 | 2.5 | 47 | 108 |
| 18S/06E-26R01 | 6/27/2001 | 126 | 54 | 7 | 449 | | 14 | 15 | 7.4 | 2.2 | 22 | 81 |
| 18S/06E-26R01 | 8/13/1991 | 142 | 44 | 9 | 522 | | 12 | 19 | 7.7 | 2.1 | 23 | 94 |
| 18S/06E-27A01 | 7/11/2001 | 130 | 60 | 9 | 465 | | 15 | 17 | 7.4 | 2.3 | 16 | 83 |
| 18S/06E-27A01 | 7/18/1989 | 138 | 50 | 10 | 418 | 180 | 13 | 7.1 | 7.6 | 2.6 | 22 | 93 |
| 18S/06E-34B01 | 7/6/2001 | 138 | 61 | 12 | 519 | | 15 | 32 | 7.3 | 2.2 | 23 | 83 |
| 18S/06E-34B01 | 8/13/1992 | 120 | 61 | 35 | 530 | | 15 | 13.3 | 7.7 | 2.3 | 17 | 96 |
| 18S/06E-35F02 | 4/21/1997 | 99 | 37 | 6 | 308 | | 9 | 2 | 7.6 | 1.7 | 11 | 56 |
| 18S/07E-34P02 | 8/14/1995 | 360 | 197 | 220 | 287 | | 123 | 123 | 7.5 | 4.6 | 320 | 922 |
| 18S/07E-34P02 | 7/19/1990 | 278 | 120 | 88 | 1463 | | 72 | 70 | 7.7 | 2.3 | 82 | 328 |
| 19S/07E-03H02 | 6/28/2001 | 246 | 152 | 128 | 1912 | | 74 | 120 | 7.3 | 3.8 | 162 | 512 |
| 19S/07E-03H02 | 8/24/1989 | 230 | 111 | 70 | 1280 | 503 | 55 | 57.2 | 8.1 | 3.2 | 108 | 400 |
| 19S/07E-04G01 | 8/25/1995 | 236 | 78 | 44 | 918 | | 37 | 44 | 7.5 | 2.1 | 58 | 145 |
| 19S/07E-04G01 | 8/8/1991 | 228 | 61 | 54 | 900 | | 29 | 38.4 | 7.8 | 1.8 | 51 | 132 |
| 19S/07E-04Q01 | 6/28/2001 | 190 | 118 | 144 | 1238 | | 46 | 82 | 7.4 | 2.6 | 73 | 171 |
| 19S/07E-04Q01 | 7/29/1992 | 184 | 61 | 57 | 817 | | 27 | 24.3 | 7.9 | 2.3 | 53 | 124 |
| 19S/07E-10P02 | 7/2/2001 | 212 | 95 | 96 | 1100 | | 44 | 86 | 7.4 | 2.2 | 62 | 160 |
| 19S/07E-10P02 | 8/24/1989 | 214 | 97 | 94 | 949 | 411 | 41 | 46.4 | 7.8 | 2.3 | 58 | 116 |
| 20S/08E-36R01 | 7/2/2001 | 202 | 116 | 126 | 1380 | | 49 | 30 | 7.2 | 2.5 | 100 | 321 |
| 20S/08E-36R01 | 8/14/1992 | 238 | 152 | 154 | 1630 | | 63 | 45.3 | 8.1 | 2.8 | 107 | 454 |
| 21S/10E-32N01 | 7/8/1998 | 322 | 360 | 341 | 3950 | | 179 | 183 | 7 | 8.3 | 350 | 1425 |
| 21S/10E-32N01 | 7/10/1989 | 357 | 325 | 1465 | 2580 | 1511 | 170 | 94 | 7.5 | 8.2 | 430 | 1696 |
| 22S/10E-16P01 | 7/5/2001 | 230 | 94 | 61 | 1104 | | 40 | 80 | 7.4 | 2.3 | 77 | 184 |
| 22S/10E-16P01 | 8/16/1991 | 246 | 91 | 98 | 1243 | | 39 | 53.3 | 7.4 | 2.3 | 80 | 220 |
| 22S/10E-28B01 | 7/1/1998 | 188 | 81 | 39 | 789 | | 29 | 35 | 7.4 | 1.8 | 40 | 137 |
| 22S/10E-28B01 | 8/28/1989 | 172 | 76 | 30 | 653 | 293 | 25 | 31.2 | 7.3 | 1.9 | 39 | 94 |